AUGUST 16, 1954

NEWS ISSUE

Electrical World

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THE HOOVER COMMISSION DEBATE:

Public Power
on one side

Private Power
on the other

. . . and the Task Force in the middle

See page 16

For interpretation of electrical industry
news see IN THE INDUSTRY . . . page 10

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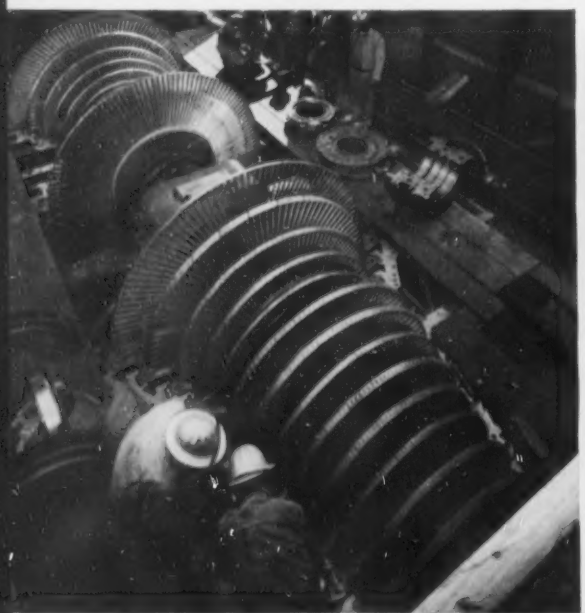

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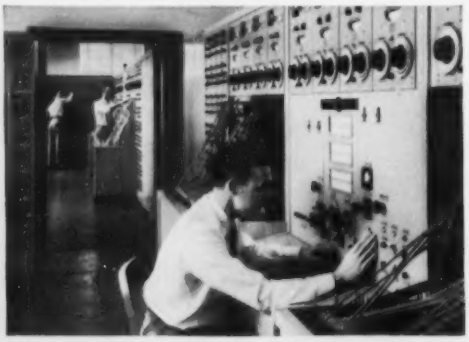

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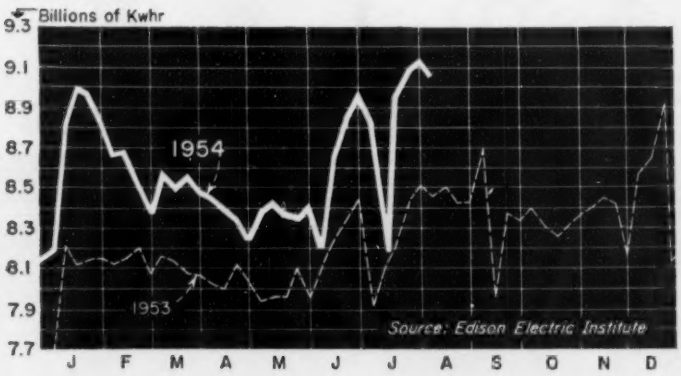
Electrical World

Published for 80 years for those engaged in the business of generating, transmitting, distributing, or applying electric power

August 16, 1954 Vol. 142, No. 7



Output Week Ended Aug. 7—9,059,000,000 Kwhr

Seasonally Adjusted Index†—175.8

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Aug. 7	+7.0	+1.6	+3.6	−3.9	+5.9	+17.6	+14.9	+5.6	+1.8	+6.9
July 31	+7.4	+0.8	+2.4	−3.0	+6.3	+16.4	+20.5	+6.0	+2.1	+7.1
July 24	+7.6	0.0	−1.7	−2.1	+14.3	+18.6	+23.8	+3.4	+1.6	+4.2

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load‡ (Million Kw)	June	78.0	73.8	73.0
Capacity (Million Kw)	June	95.31	93.81	85.06
Production (Billion Kwhr)	May	37.43	36.84	36.02
Hydro	May	10.35	9.91	10.29
Fuel	May	27.08	26.93	25.73
Fuel Consmption				
Coal (Million Tons)	May	8.67	8.68	8.59
Oil (Million Barrels)	May	4.25	4.78	6.08
Gas (Billion Cu Ft)	May	94.70	91.10	87.72
Sales (Billion Kwhr)	May	31.59	32.31	31.32
Residential	May	9.31	9.93	8.50
Commercial	May	5.62	5.62	5.18
Industrial	May	14.43	14.60	15.49
Other	May	2.23	2.17	2.16
Net Income Class A & B Companies ($ Million)	May	85.46	96.05	82.58
Estimated Dec. '54 Peak ‡(Million Kw)	May	88.1	88.4	91.8
Kwhr per Residential Customer (12 Month Average)	Apr.	2,415	2,398	2,226
Revenue per Kwhr Residential Service (12 Month Average)	Apr.	2.72¢	2.72¢	2.76¢
Canadian Production (Billion Kwhr)	May	5.93	5.65	5.76

Business Statistics

FRB Industrial Production Index†	June	124*	123	136
Gross National Product Annual Rate ($ Billion)	1st Qtr.	355.8	360.5	361.8
EW 4 Industry Production Index†	May	114.9	114.6	126.2
ENR Construction Cost Index††	July	135.0	130.5	126.6
BLS Consumer's Price Index	June	115.1	115.0	114.5
NEMA Insulation Materials Sales Index†	May	116	124	174
NEMA Electric Appliance Sales Index†	May	88	96	108
NEMA Household Refrig. Sales Index†	May	74	73	81

*Preliminary **Revised ‡Class 1 Systems †1947-49=100 ††1949=100

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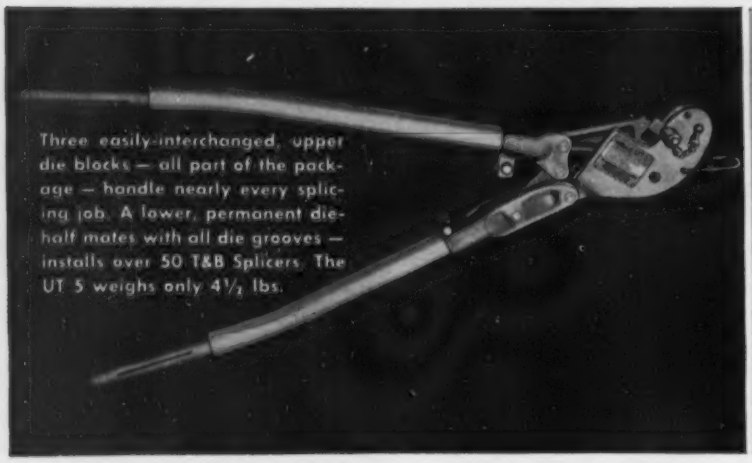

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THE ELECTRICAL WEEK

The Issue's News Highlights . . . Second session of GOP 83rd Congress can count up an impressive number of victories on power legislation. But Republicans also suffered a few important setbacks.

TVA board members Curtis and Paty take strong exception to Dixon-Yates proposal in letter to Budget Bureau and President Eisenhower.

British Columbia approves permit for Frobisher group to start power and metallurgical development.

An explosive groundbreaking Aug. 10 set off construction on the $630 million St. Lawrence Power Project. Gov Thomas E. Dewey of New York and Prime Minister Louis St. Laurent of Canada touched off a dynamite blast at the tip of Long Sault Island near Massena, N. Y., to mark the beginning of the dam and twin power plants that will be built by New York Power Authority and Ontario Hydro Commission. Later, Canadian and New York officials drove to Cornwall, Ont., for similar ceremonies.

Said AEC Chairman Lewis L. Strauss to the Veterans of Foreign Wars in Philadelphia: "Some engineer-economists foresee that by 1960—only six years from now—perhaps 10% of the new power plants on the drawing boards will have specifications for nuclear reactors, instead of coal, oil, or gas-fired boilers. Those same experts say that by 1980 perhaps half of the new plants will use fissionable materials as fuel. However, I think these forecasts are too conservative."

Simulated destruction of Grand Coulee Dam by a hydrogen bomb will offer a problem for Washington State's civil defense organization next Monday. Exercise will assume that most of the water in the 150-mile pool above the dam will be released, causing floods and a power breakdown.

Tacoma (Wash.) Public Utilities Board took steps to issue bonds for a $146 million hydro project on the Cowlitz River and approved application to the FPC for a preliminary permit to build a $22.5-million project on the Skokomish River.

Grant County (Wash.) PUD proposed that four possible licensees to build Priest Rapids Dam join in an application to FPC for a preliminary permit, decide later which of the four actually shall build it. Other three involved: Washington State Power Commission, a combination of PUDs, and a joint operating agency of public and municipal utilities.

New state-level program for building rural electric loads got under way Friday at a Chicago meeting of Inter-Industry Farm Electric Utilization Council. Five regional organization meetings were scheduled for the fall.

Off the Washington Wire . . . Patent provision in the Atomic Energy Bill as agreed on by House-Senate conferees may bring utilities into the picture in this way: Applicants for atomic power plant licenses are given preference if they agree to make their patents available for reasonable royalty to other applicants. The provision promised to stir another Senate debate. In its first go-round, the Senate had voted to make all atomic power patents subject to compulsory licensing during the initial ten-year period under the new law.

Proposed Dixon-Yates contract, which was at the center of the 13-day talkathon on the Atomic Energy Bill, is in for some revisions. For one thing, the tax account will have to be thrown in with other costs in calculating power rates on sales to the government. For another, TVA board members, including Chairman-designate Herbert D. Vogel, take a dim view of the arrangement.

Col Lyle E. Seeman will replace Vogel as Southwestern Division Engineer for the Army Corps of Engineers, headquartered in Dallas. Vogel plans to step out of the Corps Aug. 31.

Water-wasting air-conditioning systems were prohibited by an ordinance adopted by Kansas City, Mo. Ordinance will not affect existing installations or refrigeration-type air conditioners and systems which recirculate the water. New rule provides unit shall not use more than six gallons of water an hour per rated ton under full capacity.

Central Maine Power Co and five IBEW-AFL locals negotiated a 3% general wage increase for one year.

Hudson, Ohio, voters will decide Nov. 2 whether to approve sale of its power system for not less than $300,000 plus the cost of improvements since April.

Union Electric Co of Missouri sold the 10-story Insurance Exchange Building adjoining the company's main office building to Monogram Building Corp of St. Louis. The utility will continue to use at least ten floors of office space, sublet other floors.

Executive Changes . . . Duane Arnold, vice president in charge of operations for Iowa Electric Light & Power, was advanced to vice president and general manager . . . Newly elected president of Northwest Electric Light & Power Association is R. C. Setterstrom of Montana Power.

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GOP Congress' Record on Power:

Victories: New atomic energy law, five-year reactor program, authorization of federal-local partnership projects, cut in federal power budget

Defeats: Failure to pass Niagara bill, delay in authorization of Fryingpan-Arkansas and Upper Colorado, inclusion of preference clause in atomic bill

Second session of the Republican 83rd Congress devoted more attention to federal power legislation than has any session since early New Deal days.

At times, as during the 13-day talkathon on the new atomic energy bill, the public-versus-private power controversy assumed the proportions of a "great debate." Even before that, Congress had winnowed an impressive list of measures dealing with the federal role in the electric power business.

The Record

This week as the weary lawmakers prepared to close down the legislative shop in favor of more direct appeals to November voters, the Republican leaders could claim this record on power legislation:

- A brand new atomic energy law designed to foster industrial development of nuclear power.
- Approval of a five-year, six-project power reactor development program.
- Several measures clearing the way for federal-local partnership in the development of hydroelectric power.
- Substantial reductions in the federal power budget.
- Rejection of several attempts to broaden power marketing preference provisions in existing laws.

But the drive to write Administration power policy into law ran into a few dramatic short circuits. Public power crusaders, more numerous on the Democratic side, can chalk up an accomplishment or two of their own. With other opponents of Administration power policy, the public power advocates succeeded in:

- Stymying legislation which would permit additional power development at Niagara Falls.
- Stalling authorization of Administration-backed federal power projects on the Frying Pan-Arkansas and Upper Colorado Rivers.
- Writing power marketing preference clauses in the atomic energy bill.

This fall as the Congressional campaigns warm up in a number of pivotal states, the power issues raised in these records could tip the scales on control of the 84th Congress. In a few states such as Oregon and Kentucky, the power controversy is a tailor-made issue along partisan lines. In other states where federal power does not directly affect the daily life of voters, the controversy will receive no more than passing notice.

While the atomic energy bill is a monumental accomplishment for the Republican Congress, there is no reason to suspect that its major provisions differ greatly from those that would have been written by a Democratic Congress. It is not designed as a partisan measure. Indeed, the general outline of its power features were suggested by the Atomic Energy Commission while it still had a majority of Democratic appointees.

TVA-AEC Fuss

Attempts to pin a "give-away" or "big business" tag on it have thus far been largely unsuccessful. Most of the 13-day Senate tirade against the bill were not directed at its major provisions, but rather at a side-issue power contract which AEC had been directed to negotiate with an electric company group adjoining the Tennessee Valley Authority area.

President Eisenhower, himself, focused the spotlight on TVA during the early days of the present session of Congress. Rather than provide funds for the initiation of an additional 450,000-kw TVA steam plant at Fulton, Tenn., the President suggested that TVA commitments to AEC be shifted to other valley power users. AEC would then secure from private sources a block of power to replace the amount withdrawn by TVA.

It was the proposed implementation of this suggestion that led to the Senate talkathon and focused national attention on the public-private power issues. As finally worked out by AEC and a combine of two large electric utility systems headed by Edgar H. Dixon and E. A. Yates, the plan called for the Dixon-Yates group to feed power into the TVA system at Memphis replacing power which TVA was to deliver to AEC at Paducah, Ky.

Although engineeringly sound, the plan was susceptible to conflicting political interpretation. Public power advocates made loud and frequent claims that the plan was an attempt to scuttle TVA. Their argument was that privately owned utilities were now moving in the TVA area in a "nibbling" operation.

Replies by opponents that TVA was already getting a double subsidy from its AEC power sales and had feasted long enough at the public trough went largely unnoticed by the public. The Senate, however, voted specifically to authorize the type of contract proposed by the Dixon-Yates group. The House turned aside pleas to scuttle the proposed power supply contract.

Five Years—Six Reactors

With little fanfare, the Joint Congressional Committee on Atomic Energy approved a $190 million, five-year power reactor development program. This research program is primarily a government project, although private enterprise will be given an opportunity to share the costs and information developed.

The action gave Congressional clearance for the $45-million pressurized water reactor which Duquesne Light Co will operate and Westinghouse Electric Corp is now building. Four other reactor types, all looking toward economic electric power production, will be developed. In all six experimental reactors are to be built under the program.

By majority votes in both houses,

Congress extended the controversial power marketing preference clause to include power produced at government atomic energy installations. The clause, which is found in several waterpower project laws, gives public bodies and rural electric cooperatives priority in the purchase of power from government plants. Depending on the extent of government expansion in the atomic power field, this action could be the most significant power pronouncement written by the departing Congress.

As presented to both houses last week by the conference committee the new atomic preference clause does limit the priority purchases to situations where practicable, which as a new twist in preference clause legislation.

In earlier actions this session, the Senate refused to broaden the interpretation of the preference clauses in the 1939 Reclamation Projects Act and the 1944 Flood Control Act. Public power proponents had urged that public bodies and co-ops be given a continual first call on power from federal projects when, as, and if they needed it. This would rule out any firm, long-term contracts with non-preference purchasers.

Congress also refused to extend the preference clause to projects to be constructed by non-federal interests. Proponents failed to write a preference in the bill which would permit a public utility district in Washington build the proposed Priest Rapids project.

Partnership Projects

With no opposition, Congress smoothed the way for the Alabama Power Co to gain a license for a $100-million, five-dam project on the Coosa River. While the federal government was not committed to contribute to any features of this waterway development, provision is made for eventual federal reimbursement for flood control features if Congress should adopt such a policy.

Congress also cleared the way for local construction of the Priest Rapids project on the Columbia River in Washington and the Markham Ferry project on the Grand River in Oklahoma. The federal government will share the flood control costs of the Oklahoma project.

Other partnership bills given an excellent chance of passing during the current session would provide, among other things, federal contributions to multiple-purpose projects in Oregon.

Congress made several substantial cuts in the budgets for federal power agencies, although Rural Electrification Administration and Bureau of Reclamation received as much or more than requested by the President. Generally, the Eisenhower power budgets ran considerably below those requested by previous Democratic administrations, and Congress still did some snipping.

Again TVA bore the brunt of the Congressional economy axe. The President requested $141.8 million for TVA construction and salaries. Congress appropriated $120 million. Bonneville Power Administration had asked for $36.8 million, received only $29.5 million. The Administration relaxed its no-new-starts policy, but Congress didn't seem particularly enthusiastic.

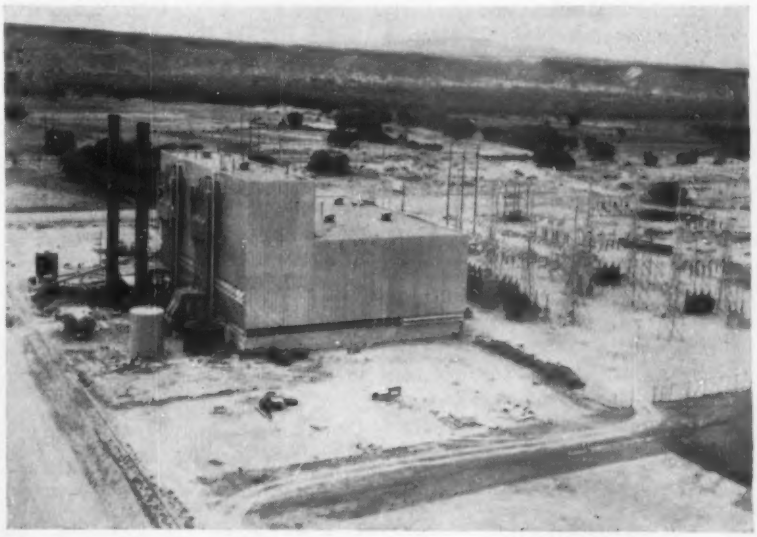
Thumbs Down on Big Projects

Continuing fight between New York State and the five leading electric companies over development of additional power at Niagara Falls led to a stalemate in Congress over permissive legislation. The House last year voted to permit the five-company group to develop the power. The Senate Public Works Committee voted out a measure which would permit New York to do the job. Rather than risk an out-and-out conflict, the Senate leadership appeared disposed to sidetrack final action on its measure for the current session.

This means that new legislation on Niagara power next year will have to travel the same legislative obstacle course already trod by the two pending bills.

Bitter disputes between upper and lower basin residents on the Colorado led to the break-up of an old East-West coalition that had once pushed through the high-cost reclamation projects. The basin dispute led to the scuttling of the Administration-backed $174-million Fryingpan-Arkansas project. The 196-188 House vote against even discussing the measure was enough to sidetrack the $1-billion Upper Colorado project, which opened the same upper-lower basin controversy.

The Eisenhower Administration had counted on both these authorization bills as a part of its reclamation record. Republican Interior officials had worked hard for their passage.



Southwest Co-op Plant Is Dedicated

The Plains Electric Generation & Transmission Cooperative this month dedicated and put into service its 30,000-kw generating plant at Algodones, N. M. Built at a cost of $5.8 million, the aluminum-sheathed structure houses two 15,000-kw generators, which can be stepped up to 17,500 kw each. The new facility will furnish power to 12 rural electric co-ops—11 of them in New Mexico and 1 in southwestern Colorado. Transmission lines will bring total cost of the project to $10 million.

Rise in Steam Power Use in Northwest Predicted

The Pacific Northwest probably will be using substantial amounts of steam-generated electricity "sooner than most people expect," and water power will be more expensive. Those are forecasts by Kinsey M. Robinson, president of the Washington Water Power Co.

Robinson believes steam power will be in substantial use in the Northwest within 12 to 15 years.

"There's a limit to economic hydro," Robinson declared in a recent talk before the Spokane Chamber of Commerce. "Facilities for no more than 7 million to 8 million kw of hydro power can be built economically in the United States."

The WWP president stated that "plants under construction and those contemplated will cost much more per kw and per kwhr than Bonneville or Grand Coulee dams." Power costing 2 mills is a thing of the past, he said. "In only a few years, the area's new power will cost 3½ up to 5 mills."

Robinson also gave progress reports on two proposed generating plans. He said WWP has spent $300,000 studying feasibility of the proposed Noxon Rapids Dam on the Clark Fork River in northwest Montana and probably will spend another $150,000 before a license is approved by the Federal Power Commission.

Five Pacific Northwest private power firms, banded together as the Pacific Northwest Power Co, expect to spend $500,000 on engineering, drilling and other field work by next July studying proposed dams at the Penny Cliffs and Bruces Eddy sites on Idaho's Clearwater River.

FPC Revises Map Series to Show 1953 Conditions

Federal Power Commission has announced revision of its map series, "Principal Electric Generating Stations and Transmission Lines in the United States."

The complete set has been revised to show conditions as of June 30, 1953. Included are 11 regional maps and 6 enlarged scale maps of congested areas. The map series is accompanied by a plant and ownership list which gives the plant name, type, capacity, location by state, and operating utility class of ownership.

Complete set of 11 regional maps, including supplementary sheets and the plant and ownership list, can be obtained for $5; individual regional maps are 50¢ each. Maps may be purchased from FPC. Order number for set is FPC-M-40.

Rehabilitation Completed at Damaged B. C. Plant

Rehabilitation and improvements to the British Columbia Power Commission's 25,000-kw Whatshan hydro development on Lower Arrow Lake, have now been completed. The plant was put out of service 11 months ago by two mud slides which destroyed the switchyard and damaged the governor and exciter of one generator. One of the two generating units went back on the line early last December.

The plant now is operating normally, serving the Kamloops and North Okanagan area, and the Needles-Edgewood-Fauquier district on Lower Arrow Lake.

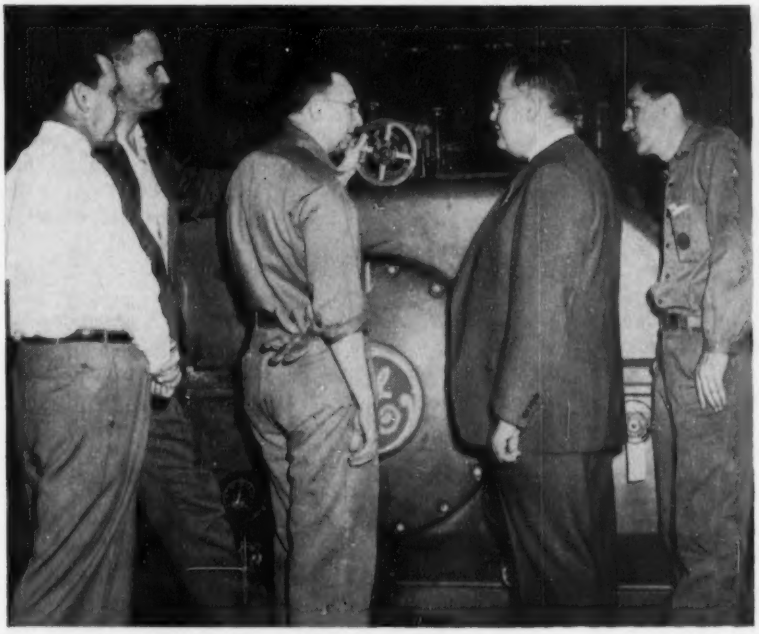
The rehabilitation project consisted of rebuilding the powerhouse structure, replacing the control switchboard, and repairing the generator; removing thousands of yards of slide material; constructing a new steel-structure switchyard and repairing cracks in the pressure tunnel which brings water from Whatshan Lake to the turbines. In addition, overburden behind the powerhouse which did not slide was removed to eliminate it as a possible hazard.

Investigation indicated water seeping from the tunnel cracks caused the slides. The tunnel will be drained for inspection probably later this year.

A Pole Climber 45 Years And Still Going Strong

Believed to be the oldest lineman in point of experience in the United States is Alvin C. Olson, lineman for the Franklin County PUD of Pasco, Wash. Now 65, Olson went to work for a telephone company in Denver, Colo., in 1907, climbed his first utility pole in 1909, and is still climbing them.

Companies he has worked for include Denver Gas & Electric Co, Colorado Power Co, Southern Colorado Power Co, Public Service Co of Colorado, Telluride Power Co, Colorado Telephone Co, Mountain States Telephone Co, Montana Power Co, Beaver River Power Co, and Pacific Power & Light Co. He also has worked for a number of construction companies doing line work under contract for utility companies.



Cromby Station's 1st Unit Put in Service

First unit of Philadelphia Electric Co's new, $57-million Cromby Station on Schuylkill River near Phoenixville has been put on the line. On hand for the start-up was Pres R. G. Rincliffe, second from right. With him (l to r) are R. P. Liversidge, vice president; W. J. De Mauriac, station superintendent; Paul E. Wilt, Jr, assistant mechanical operator; and V. S. Boyer, assistant superintendent of the plant.

This 150,000-kw turbogenerator is the first of two units. A second 200,000-kw unit is scheduled for completion next year. Ground was broken for the station in May, 1951.

2 Missouri Basin Pacts Renegotiated by USBR

Bureau of Reclamation has renegotiated the first two power sales contracts in Missouri River Basin to conform with the new marketing criteria announced last September.

These two are among the more than 250 contracts which the bureau will negotiate with power suppliers in the basin during the next six months. First new contracts will provide increased power for the small eastern Colorado community of Haxtun, population 1,000, and the southeastern Wyoming town of Wheatland with a population of 2,100.

Haxtun will receive a maximum of 650 kw, an increase from the present commitment of 450 kw. Wheatland's firm power allotment is increased from 700 to 1,050 kw under the new contract. Average cost of this service will be about 7 mills per kwhr.

The new contracts provide for increased service to meet load growth between now and the end of 1956 and for a minimum annual capacity charge to discourage the contracting of more power than actually needed. The new contracts eliminate a former provision controlling resale rates and also increase the maximum term of the contract from 10 to 20 years.

About 100 of the contracts to be considered in light of the new marketing criteria are with existing or new customers in the Western Division of the basin. The remainder affect Eastern Division customers.

To Discuss Atomic Law

Meaning and implications of the new atomic energy law will be discussed at a fall meeting scheduled by Atomic Industrial Forum, Inc. The meeting will be held Sept. 27-28 at the Plaza Hotel in New York City.

TVA Raps Plan

Directors Curtis and Paty protest Dixon-Yates proposal in letter to Budget Bureau

A majority of the board of directors of the Tennessee Valley Authority —Harry A. Curtis and Raymond R. Paty—came out strongly against the Dixon-Yates proposal to supply power to TVA in a letter to the Budget Bureau and President Eisenhower a few days after the President's directive to Atomic Energy Commission to negotiate the contract.

TVA Chairman-to-be Brig Gen Herbert Vogel (see page 10) did not take a position on the Dixon-Yates contract as such. He did point out to the Senate Public Works Committee that the issue would be decided one way or another by Congress itself when it finally approves the atomic energy law amendments.

The Curtis letter, addressed to Rowland R. Hughes with the request that it be conveyed to the President, attacked the Dixon-Yates proposal on several points:

- The contract "seems to us to be inconsistent with the statements on TVA power supply in the President's budget message of Jan. 21," Curtis wrote. The budget language, Curtis said, was that "arrangements are being made to reduce, by the fall of 1957, existing commitments of the TVA to AEC. . . ." Instead, Curtis pointed out, the instructions on the contract from the Budget Bureau actually "would bring in power for TVA's use, and not AEC's." It would not result in furnishing power for AEC, as the President's budget message contemplated, Curtis said.
- Curtis said he and Paty believe the Dixon-Yates plans are "seriously prejudicial both to TVA and to the interests of the government" and therefore urged the Budget Bureau to transmit to Eisenhower "our view that these instructions should be reconsidered."
- The letter said that West Memphis, Ark., site for the proposed plant was selected for the convenience of the utility combine, not for the convenience of the government.
- The most serious aspect of this whole arrangement," Curtis said, "is the lack of control which the TVA board would have over the costs TVA would incur."

IN THE INDUSTRY

First Republican appointee to head the vast Tennessee Valley Authority promises to administer with a firm hand and to "preserve the integrity" of the New Deal-born agency.

Vogel Passes Senate Public Works Committee

The Eisenhower nominee is Brig Gen Herbert D. Vogel, a 53-year-old, balding engineer with nearly 30 years of experience with the Army Corps of Engineers. He has an informal, but firm manner that won both the respect and the endorsement of the Senate Public Works Committee and later approval of the full Senate.

Tennessee Sen Albert Gore, a Democrat and committee member, said in a formal statement he believed President Eisenhower had "chosen wisely" in picking Vogel for the TVA chairmanship. This was the same Senator Gore that a few weeks earlier led the attack on the Administration for directing AEC to negotiate a contract with a private utility group which would bring substantial amounts of power into the TVA area.

Some Skepticism on the Appointment . . . Other TVA advocates still look with some skepticism on the Vogel appointment, although they did not try to block confirmation in the Senate. They had wanted to retain former Chairman Gordon R. Clapp as head of TVA because of his crusading, pro-public power views. Vogel's testimony during his confirmation hearing indicated that he is less of a crusader than Clapp, but no less a builder.

Taxpayers outside the Valley may now expect a clearer, less-partisan report on TVA activities than the one given by Clapp. But Vogel has made it clear he has no intention of presiding over the liquidation or even dilution of the TVA theory.

His views on TVA were brought out under questioning by Gore and Mississippi Sen John Stennis, both Democrats, during the confirmation hearings.

Here are pertinent excerpts:

Gore: "Gen Vogel, in stating to the Committee that you affirmatively believe in the wisdom and feasibility of the TVA Act, do you do so without purpose of evasion or mental reservation whatsoever?"

Vogel: "Obviously. Positively."

Gore: "Does that apply to the whole TVA Act?"

Vogel: "Yes, sir."

Sen Stennis: "Do you care to enlarge on that just a little, as to just what you mean by that in subscribing to these words here?"

Vogel: " . . . I hope—and I have no way of knowing this —that there are improvements (in TVA) still to be made because if there were not improvements to be made, I don't think I would care about the job, either.

"I don't like things that are already done. I have been an engineer for 30 years. It has been my life to construct and build. It has been my life to add some betterment to the things I have found. I hope that, in one way or another . . . that when the time comes that I leave it, I may have left it a little bit better than I found it."

Committee members showed concern that the Eisenhower Administration is unfriendly to TVA, and sought to find from Vogel the attitude of Administration officials.

Sen Gore: " . . . I would like to know the substance of your conversation with other members of the Administration. You have named the President and Mr (Sherman) Adams, I believe."

Gen Vogel: "The substance of all those talks, sir, has been one of extreme sympathy to the aims of TVA, to the desire to make it an efficient working organization and, I may say, giving it the maximum efficiency.

"I hope I will be able to do that."

Generating Expansion? . . . It was on TVA generating expansion that many of the questions hit, as this one again from Gore: What would be your attitude to attempts to disturb the peace in the valley by utility combines on the periphery of TVA seeking to invade the TVA service area? **Gen Vogel:** "I certainly feel very definitely there should not be a dilution within the valley of the kind of power which is being provided."

In further testimony Vogel described the Dixon-Yates proposal for serving AEC power through TVA facilities as a "singular event," and not as a precedent for shifting TVA power requirements to outside sources.

Only surprise came when Vogel testified he favored the contract method of construction work rather than the force account method employed by TVA. He later qualified this, saying he would fully study the advantages of force account construction in the valley before recommending any change.

Vogel showed he was not without some sense of humor in explaining the financial resources of himself and his family. Republican Sen Francis Case of South Dakota had asked him if he held any securities or had an interest in any enterprise that would conflict with his duties in the TVA job. Vogel replied:

"No, sir. I do not, but I might make mention of one thing that is a little difficult.

"My 13-year-old son has ten shares of Pacific Gas & Electric, which was bought with money that was given to him, and I don't know how quite to sell it because the law won't let him sell it as a minor.

"Now if you will introduce a special bill, we will be glad to dispose of that four or five hundred dollars worth of stock that the boy has."

Smiling, the Senators passed on to other questions. Not one offered to introduce the special bill. Instead they chose to confirm Vogel for the TVA post.

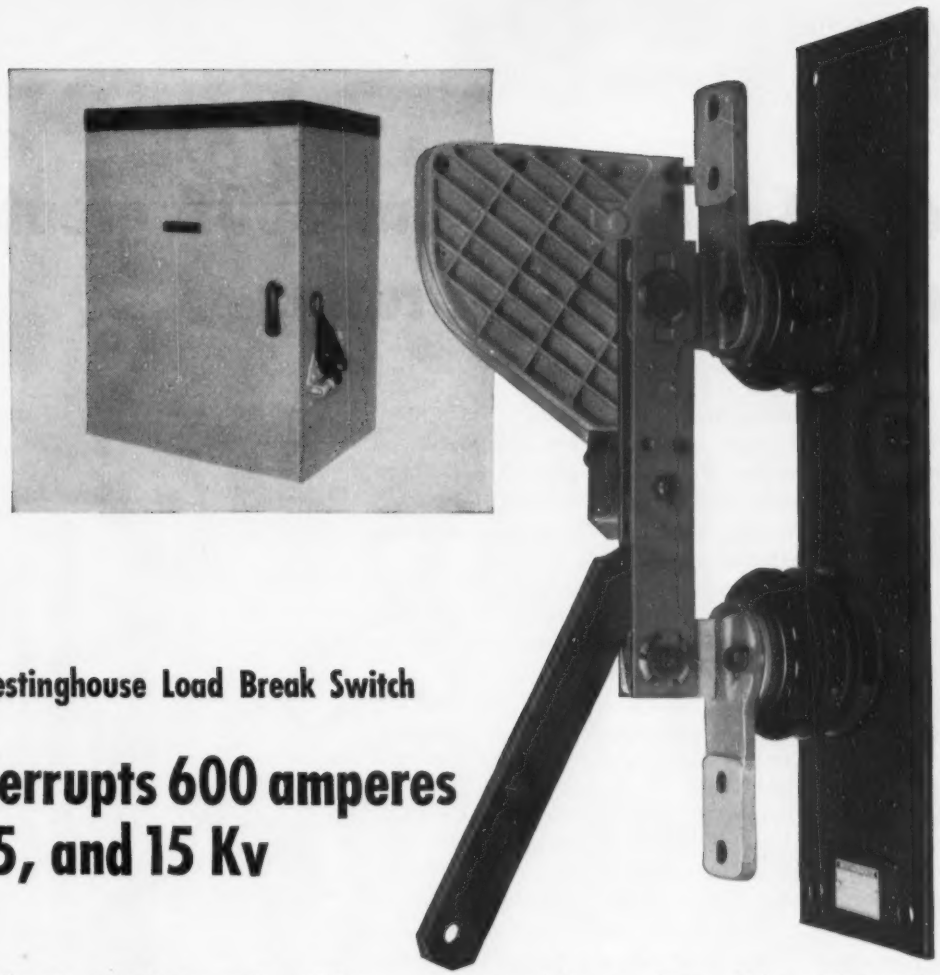
TECHNICAL NOTES

ARCHER E. KNOWLTON

Painting an outdoor boiler of 500,000 lb-per-hr rating takes about 600 man-hours, call it 1.2 man-hours per megawatt.

Silver does not form an oxide coating that affects performance of electrical joints adversely. In fact heavy current will drive off a sulfide film previously formed.

Excitation can be restored to a generator with minimum system disturbance if the system voltage has not been lowered excessively.



Improved Westinghouse Load Break Switch

Now interrupts 600 amperes at 5, 7.5, and 15 Kv

More interrupting ability—The Westinghouse line of Type LCB indoor interrupter switches has been redesigned to boost the interrupting ratings. The new design raises the rating to 600 amperes at 5, 7.5 and 15 kv. This rating applies when the switch is used as a NEMA Class B device guaranteed to operate 100 times without maintenance or repair of any kind. As a NEMA Class A device guaranteed for 500 operations, the switch will interrupt 600 amperes at 5 kv or less, 200 amperes at 7.5 kv and 100 amperes at 15 kv.

Uses De-ion® arc-quenching principle—The load-interrupting ability of the Westinghouse Type LCB switches is provided by the De-ion action. When the switch is closed, practically all of the current flows through a main blade. As the contact on the main blade starts to open, current is transferred momentarily to a quick-break blade which is inside an arc chute. When the quick-break blade is snapped open at high speed, the heat of the arc releases a blast of de-ionizing gas from the gas-generating lining of the arc chamber. This combination of quick-break and De-ion action quickly extinguishes the arc and the complete circuit is safely disconnected.

Self-cleaning contact surfaces—The contact area on each switch blade has several fine parallel ridges or teeth of solid silver. When the switch is closed, these knife-edge teeth bite into the opposite jaw block and form a highly efficient electrical contact. Opening and closing the switch forces any dirt that may occur into the spaces between the teeth, keeping the contact surfaces clean and eliminating maintenance.

Several ratings—Type LCB switches are available in several ratings from 2.5 to 23 kv, open or enclosed, single or double-throw. For more information, write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania, for a copy of Descriptive Bulletin 36-117. J-60851

YOU CAN BE SURE... IF IT'S

Westinghouse

setting the pace of transformer design for the industry

New LX-T arrester has 300% greater "dynamic" current rating

The new LX-T lightning arrester for Westinghouse "CSP®" distribution transformers is an excellent example of the progress which has been made with expulsion arresters to keep pace with distribution system requirements.

You can install Westinghouse "CSP" transformers at any point on your distribution system. This includes—up close to a substation where dynamic current is high or at the end of your rural lines where it is low. The LX-T arrester has large surge current capacity and at the same time has exceptionally high, 60-cycle current limiting ability.

Greater current limiting action gives the LX-T the highest short-circuit rating of any expulsion arrester (20,000 amperes at 3 kv, 12,000 amperes at 9 kv). A unique arc-spiraling action which stretches out the path of 60-cycle current is the big reason. If power current does flow, the unique arc-spiraling action effectively limits the flow to a very small magnitude and to a small fraction of a half cycle. Current limiting action is so effective that it *prevents any* flow of power current in at least half of all operations.

The new arrester is ruggedly mounted directly to the wall of the "CSP" transformer where it provides maximum coordination with high-voltage bushings and transformer insulation level. It is available in 3-kv, 6-kv and 9-kv ratings.

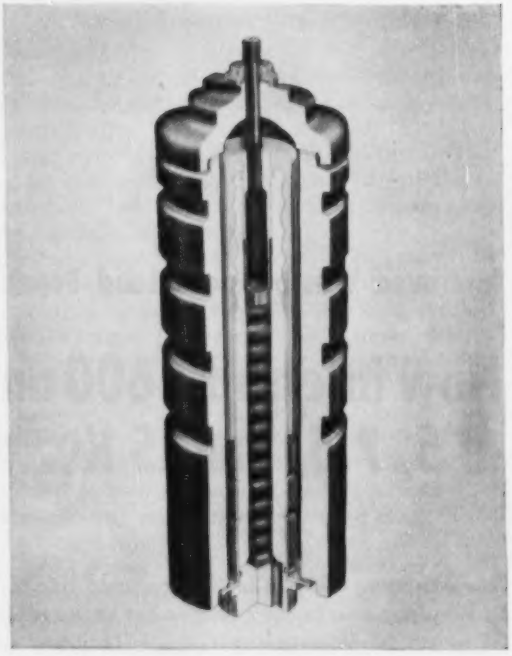
This latest development is just one of many arrester advances made since the first expulsion arrester was introduced by Westinghouse in 1932. Since then, excellent performance of 2,575,000 transformer arresters representing 18,000,000 "arrester years" has proved the effectiveness of the Westinghouse De-ion® arrester. The LX-T design has already been proved through 3 years of successful field experience with the LX distribution arrester.

For further details call in your nearby Westinghouse representative or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

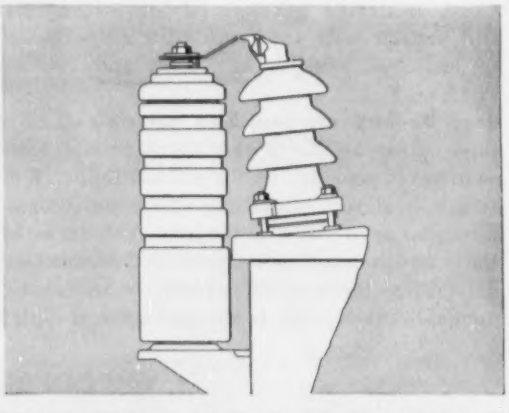
J-70731

YOU CAN BE SURE...IF IT'S

Westinghouse



The cutaway LX-T shown, illustrates the spiral filler which stretches out the path of 60-cycle current and limits it in both magnitude and duration.



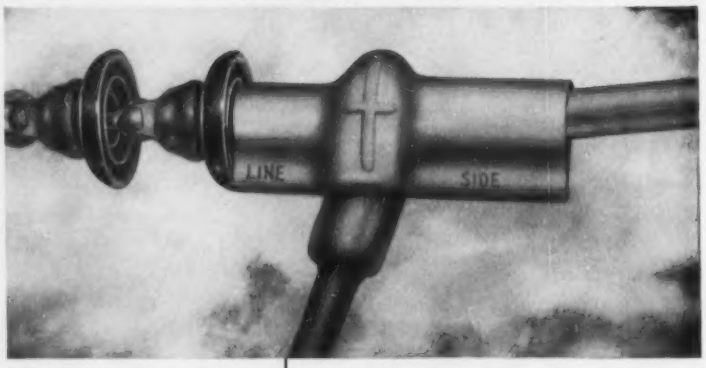
The top-series gap permits the arrester to be isolated from the line voltage except when operating. The spark-over of the LX-T is well below the BIL of the transformer it protects.

A LINEMAN ASKS—

NO. 14 IN A SERIES

"How do we blanket the 4485, 4468 and 4550 Pinco Dead-End Clamps when working lines 'HOT'?"

Here's Our Answer:



These two photographs show the blanketing method employed by a well known utility on lines where these Pinco Dead-End Clamps are installed. It's a quick, efficient, safe method using *standard insulator hood and line hose.*

LINEMEN LIKE TO WORK WITH PINCO STRAIN CLAMPS...

HERE'S WHY—

- Easy to blanket when working lines "hot."
- Have excellent snubbing action, making them easy on the conductor.
- Gentle "wave form" seat provides maximum conductor grip.
- "Come-Along" attachment is provided for easy installation of the conductor.
- Quadrant Type design of 4485, 4468 and 4550 allows continuous "running" of the conductor —eliminates necessity of cutting conductor at dead-end points to make "jumper" loops.

That's why linemen like Pinco Strain Clamps . . . and here's why utilities are specifying them for quick, easy, positive clamping of conductor in distribution line construction:

1. Time-saving features permit quick, easy, positive clamping . . . cut installation costs!
2. Rugged design and construction assures long-life; trouble-free performance. Constructed of highest quality malleable iron properly treated then hot-dip galvanized. Equipped with Steel U-Bolts and Cotter Bolts, hot-dip galvanized, also Spring Brass Cotter Keys.
3. All Pinco Strain Clamps are available for prompt shipment.

PINCO L 4550
Cable seat range .2" to .55" will accommodate All-Aluminum and ACSR conductors No. 4 through No. 1/0 and all other conductors in its cable seat range.

PINCO L 4468
Cable seat range .2" to .68". Designed for use with 2/0 through 4/0 ACSR or All-Aluminum Conductors and others in its cable seat range.

PINCO L 4485
Cable seat range .3" to .85". Recommended for use on 226,800 C.M., 300,000 C.M. and 336,400 C.M. ACSR or All-Aluminum and all other conductors in its cable seat range.

The above clamps can be supplied with Aluminum or copper liners

For complete information regarding Pinco Strain or Dead-End Clamps refer to Pinco Catalog No. 49 or contact the Joslyn office in your locality.

The Porcelain Insulator Corporation LIMA, N. Y.

Suspension Insulators. . . Clamps and Fittings. . . Switch and Bus Insulators. . . Distribution and High Voltage Pin Types. . . Guy and Tree Insulators. . . Special Porcelain.

Yukon Project OK'd

British Columbia approves application of Frobisher subsidiary for power, metals development

British Columbia has approved Northwest Power Industries' application to construct a $700-million hydroelectric and metallurgical development. The project would be constructed in the province's Atlin Lake region and would also utilize Yukon River waters (EW, Aug. 9, p 83).

B. C. Minister of Lands and Forests Robert Sommers stated that the power company, a subsidiary of Frobisher Ltd and Quebec Metallurgical Industries which are controlled by Ventures Ltd, had agreed to government requirements—principally by posting a performance bond "running into millions of dollars"—and was prepared to start construction at an early date.

The bond, Sommers said, "will be subject to annual review and will be forfeited in the event that the company fails in any respect to live up to the terms of the agreement."

90,000-Kw by '57 . . . First step in the development will provide some 90,000 kw by 1957, leading to the first major objective of 660,000 kw by 1962.

Surveys indicate an ultimate potential of about 3.2 million kw can be developed in the area.

Reynolds Seeks Power . . . In another development, Reynolds Metals Co was reported negotiating with the Canadian group for a portion of the power to be developed by Frobisher.

And a spokesman for Aluminum Co of America told Electrical World the company had not given up hope of gaining permission from Canada to divert Yukon waters to a power plant in Skagway, Alaska, for a proposed metallurgical project of its own. He said Alcoa would not formally submit its plan for approval to Canadian officials until it is known whether or not the Frobisher group can carry through its plans. At present, he said, Alcoa had no plans to ask for power from the Frobisher project.

Canadian government in January, 1953, announced in a letter to Alcoa it would not permit the use of Canadian waters for generation of power for foreign use (EW, Jan. 12, 1953, p 61).

Changes in Capacity Reported to FPC

PLANT ADDITIONS DURING JUNE

State	Utility	Plant	Fuel	Capacity (Kw)
Conn.	Connecticut Power	Montville	S	75,000
Pa.	Pennsylvania Water & Power	Holtwood	S	66,000
Ohio	Ohio Power	Muskingum	S	175,750
Ohio	Ohio Edison	Niles	S	106,000
Ill.	Illinois Power	Wood River	S	90,000
Mich.	Board of Water & Electric Light Commissioners	Moores Park	S	40,000
Mich.	Detroit Edison	St. Clair	S	125,000
Mich.	Crystal Falls Light Department	Crystal Falls	H	400
Minn.	Worthington Municipal Public Utilities	Worthington	S	10,000
Mo.	Central Electric Power Cooperative	Chamois	S	15,000
Mo.	Campbell Municipal Light Department	Campbell	IC	561
Neb.	Sargent Electric Department	Sargent	IC	648
Ga.	Georgia Power	Hammond	S	100,000
Ga.	Savannah Electric & Power	Riverside	S	20,000
Tenn.	Tennessee Valley Authority	Kingston	S	135,000
Ala.	Tennessee Valley Authority	Widow's Creek	S	112,500
Okla.	Newkirk Light & Water Department	Newkirk	IC	700
Tex.	Texas Power & Light	Rivercrest	S	90,000
Tex.	Texas Electric Service	Morgan Creek	S	60,000
Tex.	Houston Light & Power	Webster	S	100,000
Tex.	City Public Service Board San Antonio	North Side	S	60,000
Ariz.	Arizona Public Service	Sagaro	S	100,000
Utah	Utah Power & Light	Upper American Fork	H	950
Ore.	Army Corps of Engineers	McNary	H	70,000
Ore.	Army Corps of Engineers	Big Cliff	H	18,000

PLANT RETIREMENTS DURING JUNE

Ohio	Orrville Municipal Utilities	Orrville	S	750
Ohio	Ohio Power	Philo	S	40,000
Va.	Prince William Electric Cooperative	Manassas	IC	4,230
Va.	Appalachian Electric Power	Stuart Diesel	IC	150
Okla.	Pawhuska Light & Power Department	Pawhuska	IC	150
Okla.	Newkirk Light & Water Department	Newkirk	IC	100
Utah	Utah Power & Light	Upper American Fork	H	1,200
Calif.	California Electric Power	Blythe	IC	135

H—Hydro, IC—Internal Combustion, S—Steam.
United States Capacity as of July 1—Hydro, 22,719,356 kw; Internal Combustion 2,223,214 kw; Steam, 70,366,403 kw; Total, 95,308,973.

POWER BRIEFS FROM THE NEWS

• Kentucky Utilities Co has been granted authority by the State Public Service Commission to build a 100,000-kw generating unit at its Dix Dam installation. The $18-million unit, first of four planned by KU, is expected to be available for operation by late 1956.

• Hartford Electric Light Co's new steam station at Middletown, Conn., has gone on the line with operation of its initial 66,000-kw unit.

• Town of Wrangell, Alaska, has asked the Federal Power Commission for a preliminary permit for a proposed hydroelectric project on Pat Creek, Wrangell Island.

• Plans to construct a 100,000-kw steam plant at Cassville in Grant County have been announced by Wisconsin Power & Light Co. Work on the $15-20 million facility will get under way Sept. 1, 1955.

• First generating unit to be altered from 25 to 60 cycle output in the Niagara region of the Hydro-Electric Power Commission of Ontario is now producing 85,000 hp of 60 cycle power at the DeCew Falls Plant.

• Oklahoma Gas & Electric Co plans to build a 170,000-kw generating station on the east bank of the Arkansas River adjacent to its Riverbank station. Plant construction is scheduled to get started next January with operation slated for the late spring of 1956. Estimated cost of plant is $21 million.

• First turbine at Russia's Gorky hydroelectric station on the Volga River is scheduled to go into operation next December. The plant, one of the major hydroelectric projects of the fifth five-year plan, is slated to have a capacity of around 400,000 kw when it reaches full operation.

THE HOOVER COMMISSION DEBATE:

By the end of this year the Hoover Commission Task Force on Water Resources and Power will present a comprehensive report on its study of the federal power agencies. That report, by all indications, will recommend ways in which federal power functions can be curtailed, cut back or eliminated. It may well point the way toward getting the government out of the power business in toto.

The Task Force was required by the legislation which set up the overall commission to draft legislation (and possibly a Constitutional amendment) that would put its recommendations into affect. This law directed the commission to recommend means of:

- "Eliminating nonessential services, functions, and activities which compete with private enterprise;
- "Limiting expenditures to the lowest amount consistent with efficient performance of essential services, activities, and functions."

The scope of the Task Force itself was defined to include "the generation, transmission and distribution of electric energy whether generated at hydro, steam thermal or other plants."

Within that framework, the Task Force has set to work with a will. Its administrator, Charles D. Curran, upon whom devolves the responsibility for actual writing of the report, feels the commission's instructions from Congress point toward reducing expenditures. For that reason, Adm Ben Moreell, the task force chairman, picked his group from among men who believe cutbacks in federal spending for power were possible and desirable.

"You have to get someone who believes in the job," Curran commented.

With the public hearings ended (last of five was held in Portland, Ore., June 28), the Task Force is working toward specific recommedations on structural reorganization of the federal government's power agencies. Recommendations on an overall power policy will come as an adjunct to this function.

The group and its staff began by reviewing existing and proposed projects. To the staff research were added reports and comments from the various agencies—about 24 in all—dealing with power. A number of statements and proposals were submitted by interested groups and by 37 governors.

From its study of staff reports and the statements, and from consultation with the agencies, the Task Force will come up with its recommendations. That's the stage the project is in now. Task Force members, in a series of meetings, are attempting to determine what national water policy should be, and what its place in the federal government should be. From that, the group will get down to specific operations in the power field.

At this point, Curran says, the road

may become bumpy. "I know that there are differences of opinion that are sharp and marked," he commented. "I don't know whether they will be reconciled or come out with separate reports." The Administrator hopes the thinking may be coordinated.

Here is the Task Force work schedule between now and the time the overall Hoover Commission submits its final report:

Between now and the middle of September, members will meet in executive session to hear most of the principal agencies involved in federal power. The Task Force then will hold a series of meetings to draft its preliminary report to the Commission. This should be finished by November, so the parent group can submit the "comprehensive report" required of it by Dec. 31. The Task Force then will draft legislative suggestions. Those approved by the whole Commission will be included in draft legislation to be filed along with the Commission's final report May 1, 1955.

In this pattern, the public hearings have been supplemental. The hearings were added as an afterthought when public power partisans protested that they were without representation on the Task Force.

Members of the Task Force feel the primary responsibility rests with them, and not the public, to come up with recommendation on federal power reorganization. The hearings, however, did serve to develop popular (or at least, pressure-group) sentiment on the role of the federal government in resource development. They may have had some influence on the thinking of individual members of the Task Force, and in this way may be reflected in the final report when it is issued by the Commission.

The Hoover Commission recommendations are sure to set off a debate in Congress as to what the federal role should be. The next couple of years may see a complete re-evaluation of federal power policy such has not been seen in the last two decades. As well as anything, the five public hearings before the Task Force on Water Resources and Power brought out the tenor of today's thinking on the subject. Because they did, Electrical World has compiled a digest of testimony on both sides of the question, and presents it here as an issue-by-issue debate of one of the major policy matters confronting the Eisenhower Administration.

On the Cover

To the electrical industry, Clyde Ellis (on the left) and Walter Sammis (on the right) symbolize the two chief opposing concepts of power development in the U. S. Ellis, executive manager of National Rural Electric Cooperative Association, is an effective spokesman for the public power point of view; Sammis equally so for that of private power. This week EW synthesizes the arguments on both sides introduced at five public hearings of the Hoover Commission Task Force on Water Resources and Power. With the Task Force now rests the task of redefining federal power policy for the years ahead.

WHICH WAY FEDERAL POWER?

Public Power

Private Power

What general power policy should be established by the federal government?

CLYDE T. ELLIS, Executive Manager, National Rural Electric Cooperative Association

We contend that it is a democratic right and sound economics to enable the people to develop their resources, including power, on a public or nonprofit basis making possible low fixed charges, amortization of indebtedness, and freedom from the added burden of taxes on profits. This is true where municipal, county, state or cooperative enterprise is involved and where the magnitude or character of the activity requires federal participation.

1. We urge continued federal multiple purpose development of the water and related land resources of river basins for soil conservation, improved forestation, flood control, water supply, pollution control, irrigation, navigation, hydroelectric power, etc.

WALTER SAMMIS, president, Ohio Edison Co, speaking for Edison Electric Institute

We believe that based upon its past record, the American free enterprise system, functioning with private capital, under local regulation, should be encouraged to develop the water resources of our nation and, as a matter of principle, the following criteria should be established:

1. The federal government should not engage in the generation, transmission or distribution of electric power in competition with private investor owned utilities.
2. Where water power can be economically developed in connection with a multiple purpose project constructed by the Government, private enterprise should be afforded the op-

Debate continues ➤

Public Power

Ellis (continued)

2. We urge continued marketing of hydroelectric energy from such programs in a manner best designed to assure the most widespread use at the lowest possible rates consistent with payment of all costs properly allocated to power. The planning, construction, and operation of projects and the marketing of power from projects should be designed to achieve maximum efficiency, i.e. the most power at the lowest cost.

3. To give effect to the above policy, we urge the construction of transmission lines and steam stations where necessary.

4. Federal loans and technical assistance for the expansion of rural electric cooperative systems and rural power districts, including where necessary to correct monoply power supply situations, the construction and operation by such systems of their own generation and transmission facilities.

5. We urge the continuation of the Tennessee Valley Authority as presently organized and operated with adequate funds for vertical expansion of power supply to meet the needs of existing customers, including federal military installations.

6. We urge the maintenance and strengthening of the preference rights of nonprofit electric systems to first call on all federally generated power as essential to the promotion of rural electrification and the maintenance of a yardstick of competition in the electric industry.

These policies and functions could be more efficiently and economically carried out by adoption of the following recommendations:

1. Substitution of single basin or regional federal agencies having unified responsibility for the resource programs of given natural areas, in place of the divided responsibility represented by agency setup. Such agencies should be public corporations authorized to plan and carry out comprehensive water and land resources programs, as well as provide leadership in research and planning directed at more efficient utilization of other regional resources, all in cooperation with state and local agencies, including private enterprise. The objective of each of such regional agency should be conservation of resources and wider economic opportunity.

2. Vesting in such agencies of complete control of all future construction works involving major uses of the water resources, whether by state, local, or private agencies. The principle should be one river, one agency, one program.

New policies and functions for federal participation in the nation's electric power supply should include:

1. Federal investigation and planning to provide for future power supply in abundance at low cost through providing very large scale regional transmission grids integrating power production from hydroelectric developments, steam generating stations located close to large coal and lignite fields,

Private Power

Sammis (continued)

portunity to develop such water power and to construct the power features of the project.

3. Power from federal projects should be sold for its full and fair market value. There should be no subsidization in the sense of supplying power at less than its market value.
4. All federal projects producing power for sale should include as a part of the projects and operation costs such sums as would be payable as taxes by private enterprise carrying on the same or similar business. Such sums should be paid annually into the federal treasury and to state and local governments as applicable.
5. Power from federal projects should be sold without discrimination or preference as to availability, cost or contractual provisions.

The principles we have set forth herein we sincerely believe to be sound. However, we at the same time recognize that regardless of how sound a stated principle may be, unless the principle is embodied in appropriate and specific legislative enactments, there is little chance for a continued and lasting development of a sound federal water resources and power policy.

Therefore, we suggest that in addition to the recommendations as to the general policies this task force may wish to make for the guidance of the various agencies of the federal government, the task force should make specific recommendations to Congress for the enactment of appropriate laws or the amendment of existing statutes for the purpose of:

1. Removing existing inequities in the tax burden as between users of electricity;
2. Removing the existing inequities in the sale of federal power under existing preference clauses by requiring that power be sold at the point of generation and be allocated to the applicants in proportion to the number of rural, residential and retail commercial customers served by the respective applicants;
3. Removing the duplication in regulatory jurisdiction as between federal and state regulation to the end that all proper local regulation be returned to the states; and
4. Removing the discouraging and economically unfair take-over privilege of the federal government of licensed private power development to be exercised at the end of the licensed period.

FRANK M. WARREN, JR, executive vice president, Portland General Electric Co

1. The federal government should participate in power production only in connection with navigation, flood control, or reclamation work.

Debate continues ➔

more Proof!

QUALITY CUTOUTS PAY OFF IN LOWER MAINTENANCE

Actual Field Tests of KEARNEY H-D TRIP-O-MATIC CUTOUTS

*Taken at random from the regular production line.

Demonstrate High Short Circuit Interrupting Capacity

TEST: Two standard, 100 ampere, 5 KV TRIP-O-MATICS* (indicating 12143-20 and non-indicating 12143-21) were subjected to faults on the 5 KV side of a 10,000 KVA transformer.

RESULTS: At 5 KV with a power factor of 20%, the Heavy Duty Trip-O-Matic Cutout successfully interrupted nine shots, ranging from 5500 to 6350 amperes, RMS. Three additional tests were made on the same box with a new door installed, successfully interrupting 5800, 5750 and 6050 amperes.

After the short circuit test, a heat run was made on the same non-indicating box. Maximum temperature rise was found to be 21°C, as compared to the 30°C allowed by NEMA on new cutouts.

These test results are proof-positive that Kearney cutouts protect your circuits with *even greater* short circuit interrupting capacity than their nameplate ratings.

NOTE: These reports are NOT BASED ON CALCULATION! They are the results of actual field tests at Kearney's 34.5 KV substation. Power was taken from the Union Electric circuit providing a 445,000 KVA backup.

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO. GUELPH, ONT.

The Mark of Quality Products

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Ave. • St. Louis 10, Missouri
Canadian Plant: Guelph, Ontario

Cheaper cutouts than Kearney can be made — but none that save you more in the long run. There's just no substitute for quality in protection of distribution circuits — and profits. The engineering skill, top-quality materials, and extra-long life built into all Kearney products pay off endlessly in more economical and safer maintenance. Specify Kearney for lasting satisfaction that saves and saves and saves! Ask your Kearney Representative or write for catalog information today.

Specify **KEARNEY Products**

For Better Construction . . . For Safer Maintenance

Public Power

Ellis (continued)

atomic power plants, and possibly wind power.

2. Federal provision for carrying out the program formulated through such investigation, including construction of large federal atomic power stations.

3. Federal prohibition of the use of rate payers funds to spread propaganda against competition in the utility industry or to influence elections.

4. Consideration of a policy of limiting federal corporation taxes on private power companies to that portion of net income in excess of a fair return on a net investment rate base.

R. L. SCHACHT, president, American Public Power Asso.

(In his testimony, Schacht presented recommendations on general policy similar to those offered by Ellis. In addition, he proposed that the feasibility of federal power projects be subject to review by an agency independent of any now engaged in the generation and marketing of power. His amplification of this proposal follows.)

Such an independent Board of Review should be established under the Bureau of the Budget, or the President, to scrutinize and report on the plans and estimates of cost of proposed multipurpose projects as well as to study benefit values and cost allocations.

An independent Board of Review such as we advocate should contribute much toward bringing about greater uniformity in policies between the various agencies operating in the field of water resource development. Such a Board should also tend to lessen duplication of functions.

(Other testimony by Schacht is found below)

Private Power

Warren (continued)

2. Federal responsibility to market power should be limited; the government should construct transmission lines only as necessary to interconnect projects in accord with sound engineering and business principles, and to deliver power to distributing systems or large industries.

3. Federal agencies should not be allowed to regulate themselves—to decide what is nondiscriminatory or reasonable.

4. The FPC should have powers to license both federal and non-federal generating installations; approve rates and tariffs, etc.

5. Rates for sale of federal power should cover all costs, including taxes or their equivalent.

6. Present preference and priority provisions for federal power should be reviewed and amended to provide a project guarantee against any abridgement of rights to the use and benefits of water resources.

HOWARD A. MILLER, assistant general manager, Los Angeles Chamber of Commerce

The United States has become great because of its encouragement to private enterprise and the limiting of federal government to those activities essential to the general welfare which cannot be undertaken by private enterprise.

The idea that some part of a reclamation project can be justified on an intangible or undefined basis is spurious thinking.

Who benefits from Administration's "partnership" principle?

THOMAS L. SCANLON, director of research, Oregon State Federation of Labor, AFL

The partnership proposal of the administration would operate in such a way that the private utilities will benefit the most from the revenue producing factors, and would return us to the pre-1930's when a few private utilities dominated and monopolized the region's economy.

A river authority plan—retaining the best features of operation of private industry, but operating as a corporation with the government holding the stock—is the soundest method of basin development.

I do not favor federalization of any industry, but I feel that the federal government is the only group able to develop water resources in this region.

TOM H. TEMPLE, International Asso. of Machinists, AFL

Federal control and operation of multi-purpose power generating and transmission systems in the

ALLAN A. SMITH, representing Pacific Power & Light, Portland General Electric, Washington Water Power

The companies are convinced, the most practical way of meeting the requirements of the area is through the "partnership" principle. Local participation is good because it places the responsibility where the benefits are to be realized and helps to keep them reasonably in balance.

Experience of the companies leads to six recommendations:

1. Local agencies should be allowed and encouraged to finance power facilities in federal multi purpose projects.
2. The federal government should finance multi purpose projects chargeable to non-reimbursable or partially non-reimbursable features where local agencies are prepared to finance the power facilities.
3. No new government agency having power over regional development should be created.

Debate continues Page 25 ➔

LOOK!...

another great technological advance

THE NEW SMD-1 POWER FUSE

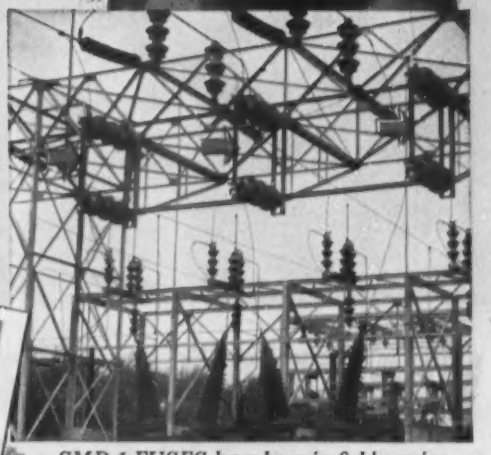
developed to protect your system with the highest reliability, at the lowest cost

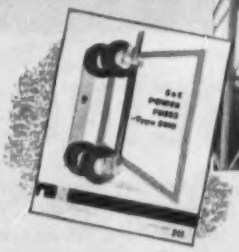
S&C's new Type SMD-1—a 500,000 kva* fuse embodying the engineering achievements of the well-known SMD-2—marks another milestone in the fuse art. It has technological innovations which enable it to fill a void in the economics of power system protection.

**Three-phase symmetrical*

DESIGNED FOR APPLICATION on primaries of power transformers tapped directly on transmission and subtransmission lines, Type SMD-1 Power Fuse provides dependable interruption of both high and low fault currents—regardless of type of system or type of fault. Time-current characteristics are accurate and permanent—unaffected by corrosion, aging, vibration, or surges. Transient-recovery voltages are no problem during circuit interruption, since fuse flashover withstandability equals the protected insulation level of the system.

Complete information on how the SMD-1 Fuse will fit profitably into your power system is contained in this new Catalog Section 261 . . . we will gladly send you a copy.





SMD-1 FUSES have been in field service since March, 1952. The fuses have had many occasions to clear faults, and have done so successfully in each case.

S&C ELECTRIC COMPANY

4421 RAVENSWOOD AVENUE
CHICAGO 40, ILLINOIS, U. S. A.

IN CANADA:
S & C ELECTRIC CANADA, LTD.
8 Vansco Road, Toronto 14, Ontario

POWER FUSES • DISTRIBUTION CUTOUTS AND FUSE LINKS • LOAD INTERRUPTERS • METALCLAD SWITCHGEAR

Specialists in High-Voltage Circuit Interruption

WATCH IT BEING INSTALLED

Two big General Electric power transformers recently made news and you can watch them making it in the 23-minute, G-E color movie, ***Power in Place.***

This documentary film shows the whole installation process in clear detail, from sliding the transformer off the flatcar to the assembly of bushings and accessories. Everyone who installs transformers—or would like to see it done—can gain some helpful ideas by watching the installation of a 145,000-KVA unit at the Oak Creek Station of Wisconsin Electric Power Company, and a 135,000-KVA unit at the Delta Station of the Mississippi Power and Light Company. For full information about this educational G-E film, just contact your nearest G-E Apparatus Sales Office. General Electric Company, Schenectady 5, N. Y.

421-20

Progress Is Our Most Important Product

GENERAL ELECTRIC

TRANSFORMER Treasure Hunt

General Electric offers a new transformer for oldest G-E unit in ASA range

To promote the benefits of standardized transformers and to commemorate the dedication of its new Repetitive Manufacture transformer plant, General Electric plans a unique monument. The Company is sponsoring a "treasure hunt" to find the oldest G-E (or Stanley Electric) transformer in the RM range of ratings that was still in operation on May 11, 1954, the day the plant was dedicated. The prize, in exchange for the oldest unit, will be a new G-E self-cooled, oil-insulated transformer of equivalent rating delivered free of charge.

BONUS PRIZE FOR REPLACEMENT BY RM UNIT

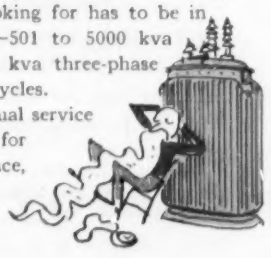
If the winning transformer can be replaced with an RM unit having kva and voltage ratings and impedance values which are listed in the ASA standard, there will be an extra bonus in the form of an all-expenses paid trip to G.E.'s new Rome, Ga., plant for a man in the winner's organization.

WHO CAN PARTICIPATE?

All electric utilities, manufacturing, and transportation companies are invited to take part in this nationwide transformer "treasure hunt."

WHAT TRANSFORMER WILL QUALIFY?

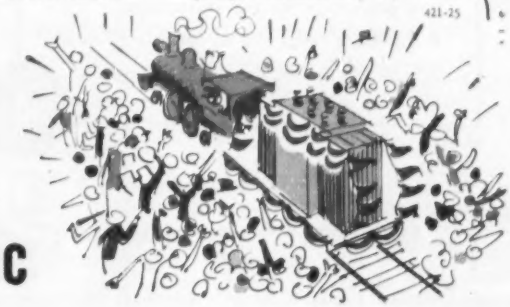
The transformer G.E. is looking for has to be in the ASA range of ratings—501 to 5000 kva single-phase, 501 to 10,000 kva three-phase, 69,000 volts and below, 60 cycles. It must have been in continual service as of May 11, 1954—except for normal periods of maintenance, spare duty or relocation.



HOW TO ENTER THE "TREASURE HUNT"

It's easy to enter the treasure hunt. It's fun. And it may be profitable. But, do it right away. Your entry must be post-marked not later than November 1, 1954. If you have a transformer "old timer" still in operation, why not ask your G-E Apparatus Sales Representative for a "treasure hunt" entry blank. Or write for Entry Form GEZ-1046. General Electric Company, Schenectady 5, N. Y.

421-25



Progress Is Our Most Important Product

GENERAL ELECTRIC

Outdoor splashproof synchronous motor, rated 2,000 hp, 1,200 rpm. This motor drives a centrifugal compressor in a chemical plant.

The ELLIOTT *Outdoor Splashproof* SYNCHRONOUS *Motor*

- Water is removed from the ventilating air by the external water separators before the air enters the motor enclosure.
- Stator coils are vacuum pressure impregnated to withstand the effects of high humidity or moisture.
- The stator is completely immersed in varnish and baked dry after it is completely wound. This provides a rust preventative treatment for the entire inside of the stator as well as additional moisture protection for the stator coils.
- Collector rings are accessible through a removable transparent cover.

R4-11

With the flying start of hundreds of successful installations of the famous Elliott outdoor splashproof (weather protected) induction motor, Elliott now offers a synchronous motor with similar advantages — splashproof economy with complete immunity to hurricane-driven mist, dust, rain, sleet or snow, and extremes of temperature.

Having passed every test in up to three years of service, Elliott synchronous motors of outdoor type, both vertical and horizontal, are now made available in capacities from 150 hp up. Contact your local Elliott field engineer for details, or write Elliott Company, Ridgway Division, Ridgway, Pa.

Elliott FABRI-STEEL MOTORS AND GENERATORS

ELLIOTT Company

Public Power

Temple (continued)

Columbia River Basin are the most practical and efficient means of coordinating such projects.

Nebulous plans for dismantling Columbia development whether called partnership or interstate compact, retard the wealth of the area and definitely are not to the benefit of the people. While sweet music is played in accompaniment to this (partnership) program, its volume cannot be turned loud enough to drown out the discords and disadvantages.

Private financing under the partnership plans would only increase power rates, with profits going to a relatively few people.

Private Power

Smith (continued)

4. The people of a locality should be allowed to make their own decision as to whether they want to be served by an investor owned or a politically controlled utility.
5. Transfer of ownership of federally owned generation or backbone transmission facilities will not accomplish any great purpose, and certainly will not increase the power supply of the Northwest.
6. Local agencies should be responsible for building necessary transmission lines to generating facilities which they own.

How should the preference clause be administered the federal government?

R. L. Schacht, president, American Public Power Asso.

APPA does not and never has advocated federalization of the power industry in the U. S. The preference clause is a part of the very core of American philosophy for development of water resources.

Nearly 40% of federal electricity is sold to private industry and electric companies. Preference does not promote municipal power, as shown by the fact that the number of municipal systems has declined during the last three decades.

Operation of the preference clause has resulted in rate reductions not only for customers of public power systems, but also for customers of adjacent privately owned systems.

The federal government should be allowed, where necessary, to construct transmission lines from federal projects, in order to prevent sales at bus bars almost exclusively to private companies. Most local public systems cannot purchase at the bus bar because of their smaller size and limited service areas.

W. D. JOHNSTON, vice president, Mountain States Power

Through exaggerated interpretations of the so-called preference clause, preference customers of the Bureau of Reclamation are demanding and claiming exclusive rights to all future developed federal power and also to all such power now being distributed by the Mountain States Power Co and other private utilities. We ask who should equitably have the preference, if any, in allocation of federal power? An honest answer would be—the private distributor. The preference is now given to the public distributing agencies, cooperatives, etc., is based on their being so-called non-profit organizations. We all know that in the regulated private utility industry, there is no such thing as 'profit'—nothing more than a reasonable and legal return on actual invested capital—just simple wages for money invested in necessary facilities to serve. It is no different than the interest paid on the invested capital by the public distributing agency. The preference clause is unjust, indefensible, and intended to socialize the industry.

Tennessee Valley Authority expansion: Lateral, vertical, or not at all?

FRANK G. CLEMENT, Governor of Tennessee

The success of TVA is due to cooperation among federal, state and local agencies. It is a partner of state and local agencies, which is not always understood. For example, our $400 million in distribution systems just about matches that part of TVA power investment devoted to us.

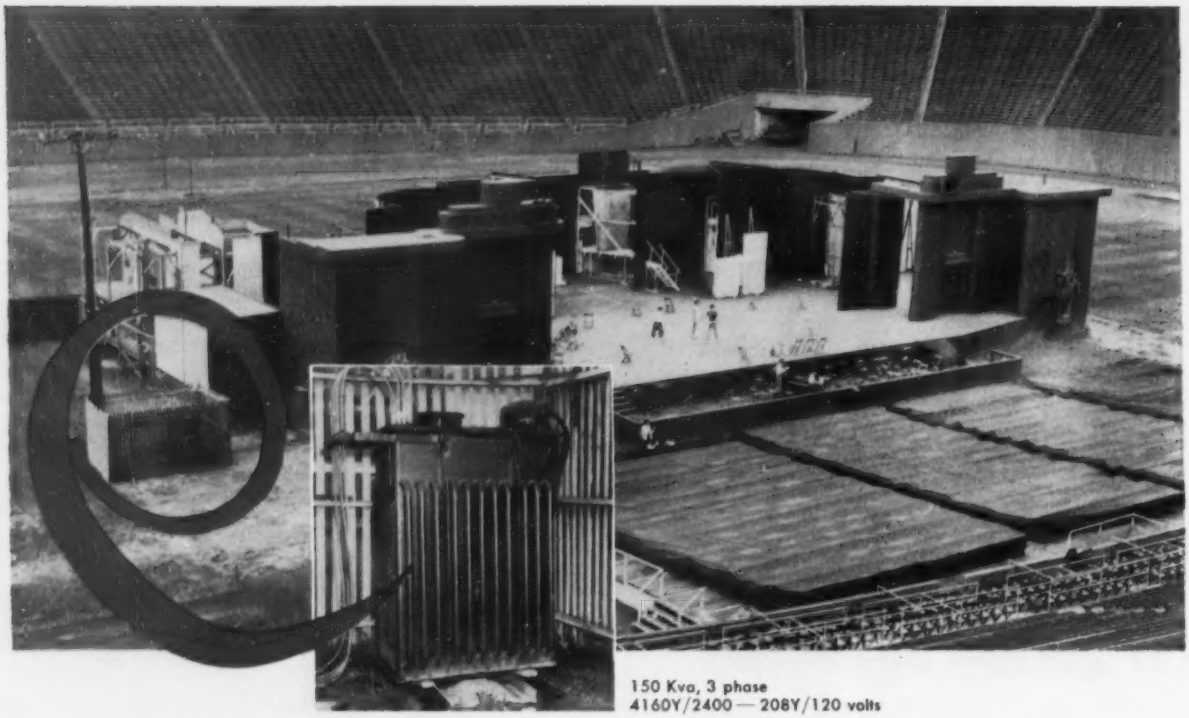
Congress' vision of public development of the Tennessee River Valley was born, most of all, of the lack of vision and boldness of the procession of

R. B. WILSON, vice president, Mississippi Power & Light

Company's relations with TVA at the operating level have been good. This statement applies to the policy and philosophy of the Authority. These are some points at issue:

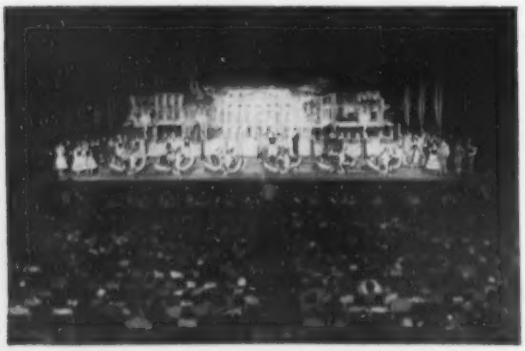
1. TVA took the position early that the TVA Act empowered it to serve any customers "within transmission distance"—which was impossible to define.
2. Unwarranted costs were assigned to naviga-

Debate ends Page 27 ➤



150 Kva, 3 phase
4160Y/2400 — 208Y/120 volts

POWER for the Pittsburgh Civic Light Opera distributed by a PENNSYLVANIA POWER PAC TRANSFORMER



PENNSYLVANIA TRANSFORMER COMPANY

A McGraw Electric Company Division

CANONSBURG, PENNA.

FOR the past three summers, Duquesne Light Company has used a Pennsylvania Power Pac transformer to supply power for the Pittsburgh Civic Light Opera presentations at Pitt Stadium. Because of its versatility, small size, and light weight, the Power Pac is ideal for temporary service.

The Power Pac may be designed for three phase only, if three phase at utilization voltage can supply both power and lighting loads. If a customer requires both three phase and single phase power, then a combination three phase/single phase unit may be supplied.

This pre-assembled, single tank unit is suitable for either individual or multiple customer service with adequate provisions for metering where needed.

In addition to simplified installations and reduced labor costs, Power Pac advantages include greater safety to operating personnel, reduced vault space requirements, and less wiring expense.

For complete information on the Power Pac assembly, write to Distribution Sales Department, Pennsylvania Transformer Company, Box 330, Canonsburg, Pa., and ask for Bulletin No. 8534.

Public Power

Clement (continued)

private enterprises which had come before. Largely because of TVA's cooperation with state and local agencies, federal employment and payrolls are small per capita in the Valley than in the nation as a whole. In no other major area of the country do the local people do more of the job of distributing electricity than in the TVA area.

• Insofar as we have been able to discover, no member of this Task Force has expressed either an understanding of, or sympathy for, public power as a competitive force in the field of private electric utility monopoly. For instance, Chairman Moreell, on Nov. 10, 1952, said: "The policy now is for government to take land from private owners and in strict accord with Marx's doctrine, to use it in public purposes. The public purposes may be an irrigation or flood control district, a Tennessee Valley Authority or a Bonneville Power Project . . . or any one of a number of others."

We here in the hills and valleys of Tennessee have a peculiar but a fair philosophy. We like to be tried by a judge who has not announced his decision of the case before taking the proof.

Private Power

Wilson (continued)

tion and flood control and not enough to power.

3. TVA expropriated complete properties of 27 electric companies and seized part of the properties of seven others.
4. TVA cities are obligated under captive contracts to take all their power from TVA.
5. TVA has used the requirements of non-preference industrial customers as justification for additional appropriations for new generating stations.
6. Seemingly, TVA has abandoned any pretense that it is concerned only with the sale of power incident to navigation and flood control development.
7. TVA has an absolute power monoply in the area it has pre-empted.
8. It makes no attempt toward economic justification of projects it desires to build.
9. It is free from regulation by the government.
10. Taxes and cost of money for TVA are tranferred to the taxpayers of the nation who are not in a position to benefit from TVA power.

Public or private redevelopment of the Niagara?

STEPHEN G. McMULLEN, member of executive board, Gas, Coke and Chemical Workers, CIO

Unless there is a reversal of the current trend of federal power policy in the Administration the people will soon lose their rights to one of the few remaining sources of low-cost hydro power in the nation. Both the Dondero, Miller-Capehart Bill passed by the House, and the current Case Bill (which, with no preference clause, would give jurisdiction to FPC) fail to protect the consumer.

The CIO favors the principles of the Lehman-Roosevelt Bill, which backs state development of the Niagara but with a preference clause.

EARLE J. MACHOLD, president, Niagara Mohawk Power Corp

A government development at Niagara, whether federal or state, would constitute a wholly unwarranted intrusion by government into the field of private enterprise. We believe that private enterprise should be permitted to complete this development in which it pioneered and which it has been ready, able and willing to complete for over 30 years.

Hells Canyon: Part of federal basin development or the Idaho Power system?

E. W. KENNY, director of research, International Woodworkers of America, CIO

1. The key to the comprehensive development of the Columbia basin has been federal participation in its planning and implementation.

2. Generally, the low-cost power areas are federal power areas—and government payments "in lieu of taxes" may in some cases be higher than the taxes paid by private companies.

3. Abandonment of the Hells Canyon site on the Snake River by the Department of Interior casts an ominous cloud over future flood control programs.

R. E. GALE, vice president, Idaho Power Co

1. Idaho Power supports sound reclamation, and recognizes that power generation facilities can economically be installed as an incident to the major irrigation objective.

2. The company is ready at all times to provide a market for surplus reclamation power, or to install generating facilities in multipurpose projects.

3. Idaho Power's plan for Hells Canyon is a prime example of resource development which citizens are willing and able to undertake under regulatory safeguards, at a huge saving to the federal treasury.

Power

Many utilities discover new economies with standardized designs... lower initial cost, shorter shipment, easier and faster installation

ALLIS-CHALMERS POWER Transformers

Three Purchasing Case Histories Tell Actual Dollar Savings Possible

1 **A MIDWEST UTILITY SAVED** $6,065.00 on one purchase of an Allis-Chalmers standardized unit on which it was possible to choose a different rated high voltage. For years this utility had purchased transformers with rated high voltage 66,000 delta and four 2½% full capacity taps below normal. By rating a standardized unit with high voltage of 62,700 and full capacity taps of 66,000-64,350-61,050 and 59,400 — a standardized unit was purchased at an approximate savings of 7%.

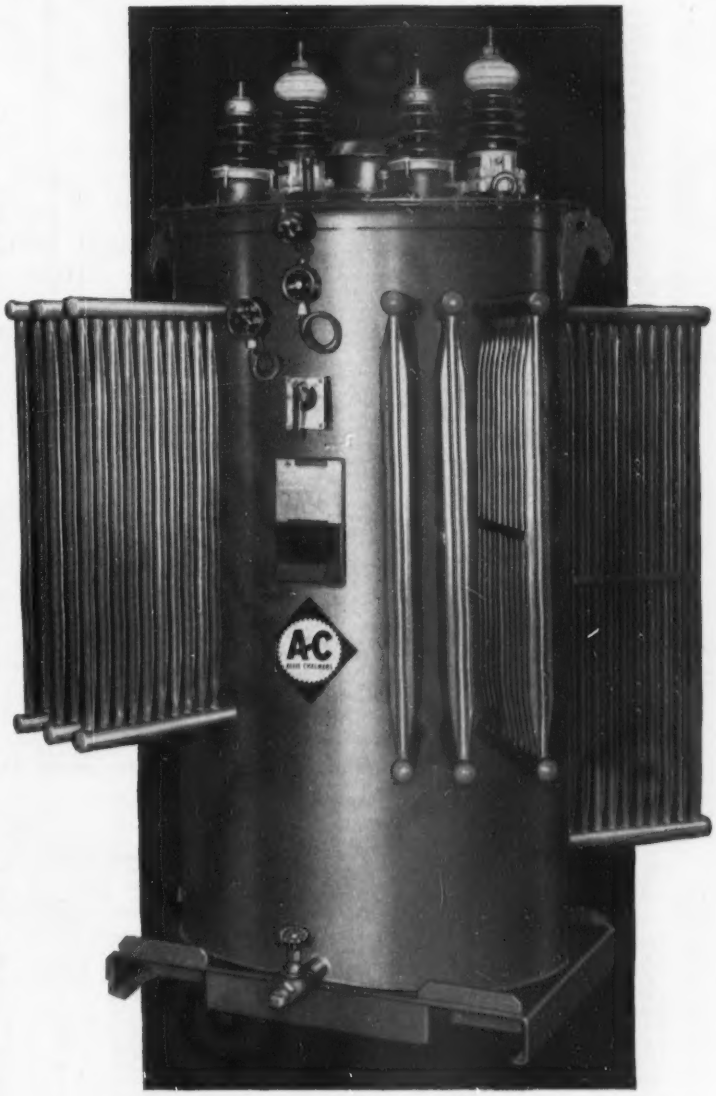
2 **AN EASTERN STEEL COMPANY SAVED** $1,920.00 with an Allis-Chalmers standardized unit. The new transformer, high voltage 67,000 volts, low voltage 7200 volts, will operate at 6900 volts at slightly reduced kva. This makes possible operation in a bank with an existing 6900-volt transformer. This customer foresees even greater savings when more standardized units are purchased.

3 **A SOUTHERN UTILITY SAVED** $1,557.00 by purchasing Allis-Chalmers standardized power transformers. It was found that three 1667-kva single-phase transformers rated at 13,200 voltage delta with two 2½% full capacity taps above and below normal to low voltage 2400/4160Y could be paralleled satisfactorily with existing non-standard transformers rated 1667 kva having a high voltage of 13,200 delta and taps at 12,540-12,210-11,880 to low voltage 2300/4000 wye (the transformer to be over-excited for 2400/4160 wye output).

ALLIS-

Transformers

Allis-Chalmers standardized design power transformers offer utilities attractive savings in time and money compared to special designs. Standardization eliminates or reduces engineering and manufacturing time, results in savings up to 8% of the total cost of a transformer. Delivery can be made faster than with special transformers. Installation is simplified by standardized location of accessories. If certified drawings are required, they can be obtained immediately in many cases.



Other Features Available

Manufactured in accordance with NEMA and ASA C57.12a Standards, these transformers are available in ratings up to 5000 kva single phase and 10,000 kva three phase. Considerable flexibility is available too. Other features include variations in primary voltages, junction boxes, different types of oil preservation, as well as other mechanical and electrical features.

It will pay to get complete details on savings made possible by Allis-Chalmers standardized transformers. Call your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wisconsin, for more information.

A-4429

A-C ALLIS-CHALMERS

CHALMERS

Interior's Power Projects

OPERATING PLANTS

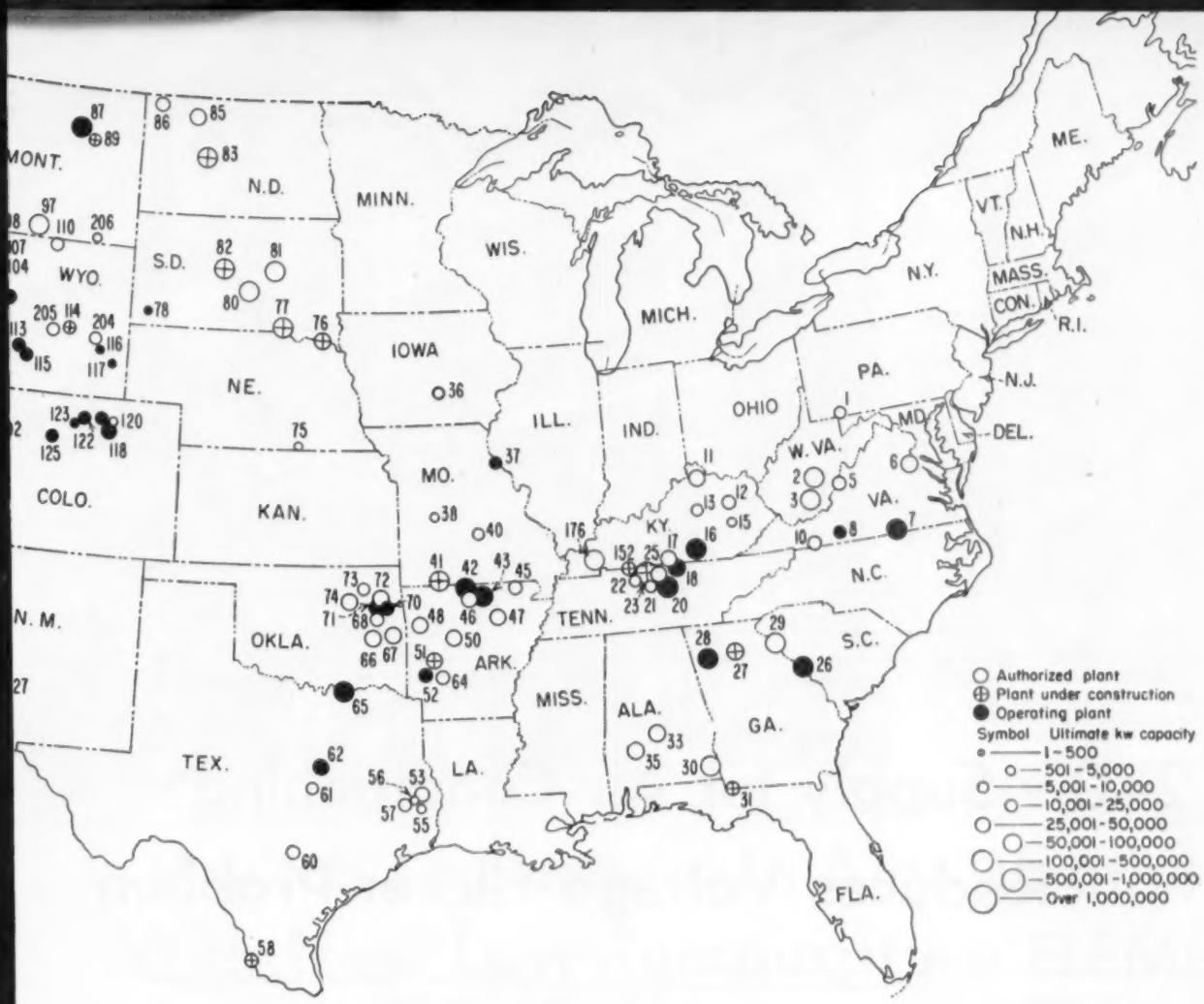
Map No.	Project or plant	State	Marketing Agency	Capacity in Kw: Present	Under Construction	Additional Authorized or Initial	Total Ultimate
77	Ft. Randall	S. D.	USBR	40,000	280,000	0	320,000
78	Angostura	S. D.	USBR	1,200	0	0	1,200
87	Ft. Peck	Mont.	USBR	85,000	0	80,000	165,000
93	Canyon Ferry	Mont.	USBR	50,000	0	0	50,000
107	Heart Mountain	Wyo.	USBR	5,000	0	0	5,000
108	Shoshone	Wyo.	USBR	5,600	0	0	5,600
111	Boysen	Wyo.	USBR	15,000	0	0	15,000
112	Pilot Butte	Wyo.	USBR	1,600	0	0	1,600
113	Kortes	Wyo.	USBR	36,000	0	0	36,000
115	Seminoe	Wyo.	USBR	32,400	0	0	32,400
116	Guernsey	Wyo.	USBR	4,800	0	0	4,800
117	Lingle	Wyo.	USBR	1,400	0	0	1,400
118	Flatiron	Colo.	USBR	31,500	38,200	0	69,700
121	Polehill	Colo.	USBR	33,250	0	0	33,250
122	Estes	Colo.	USBR	45,000	0	0	45,000
123	Marys Lake	Colo.	USBR	8,100	0	0	8,100
125	Green Mountain	Colo.	USBR	21,600	0	0	21,600
127	Elephant Butte	N. M.	USBR	24,300	0	0	24,300
130	Siphon Drop	Calif.	USBR	1,600	0	0	1,600
131	Parker	Cal.-Ariz.	USBR	120,000	0	0	120,000
132	Davis	Nev.-Ariz.	USBR	225,000	0	0	225,000
133	Hoover	Nev.-Ariz.	USBR	1,249,800	104,500	0	1,354,300
137	Minidoka	Idaho	USBR	13,400	0	0	13,400
140	Anderson Ranch	Idaho	USBR	27,000	0	13,500	40,500
141	Boise River Diversion	Idaho	USBR	1,500	0	0	1,500
143	Black Canyon	Idaho	USBR	8,000	0	0	8,000
153	Prosser	Wash.	USBR	2,400	0	0	2,400
167	Shasta	Calif.	USBR	379,000	0	0	379,000
168	Keswick	Calif.	USBR	75,000	0	0	75,000
91	Hungry Horse	Mont.	BPA	213,750	71,250	0	285,000
150	Grand Coulee	Wash.	BPA	1,974,000	0	0	1,974,000
157	McNary	Wash.-Ore.	BPA	280,000	706,000	0	986,000
158	Bonneville	Wash.-Ore.	BPA	522,400	0	0	522,400
160	Big Cliff	Ore.	BPA	18,000	0	0	18,000
161	Detroit	Ore.	BPA	100,000	0	0	100,000
7	John H. Kerr (Buggs Island)	Va.	Sepa.	204,000	0	0	204,000
8	Philpott	Va.	Sepa.	14,000	0	0	14,000
16	Wolf Creek	Ky.	Sepa.	271,200	0	0	271,200
18	Dale Hollow	Tenn.	Sepa.	54,600	0	0	54,600
20	Center Hill	Tenn.	Sepa.	136,200	0	0	136,200
26	Clark Hill	S. C.-Ga.	Sepa.	200,000	80,000	0	280,000
28	Allatoona	Ga.	Sepa.	74,000	0	36,000	110,000
42	Bull Shoals	Ark.	SPA	160,000	0	160,000	320,000
43	Norfork	Ark.	SPA	70,400	0	70,000	140,400
52	Narrows	Ark.	SPA	17,000	0	8,500	25,500
62	Whitney	Tex.	SPA	30,000	0	0	30,000
65	Denison	Tex.-Okla.	SPA	71,200	0	105,000	176,200
70	Tenkiller Ferry	Okla.	SPA	34,000	0	0	34,000
71	Ft. Gibson	Okla.	SPA	45,000	0	22,500	67,500
37	Louisiana (Steam)	Mo.	Bureau of Mines	22,500	0	0	22,500
92	Big Creek	Mont.	Bur of Indian Affairs	320	0	0	320
128	Coolidge	Ariz.	Bur of Indian Affairs	10,000	0	0	10,000
101	Yellowstone (IC)	Wyo.	Nat'l Park Service	420	0	0	420
102	Yellowstone	Wyo.	Nat'l Park Service	300	0	0	300
102	Yellowstone (IC)	Wyo.	Nat'l Park Service	225	0	0	225
163	Mt Rainier	Wash.	Nat'l Park Service	100	0	0	100
172	Yosemite	Calif.	Nat'l Park Service	2,000	0	0	2,000
	Total (57 Plants)			**7,070,065**	**1,279,950**	**495,500**	**8,845,515**

PLANTS UNDER CONSTRUCTION

Map No.	Project or plant	State	Marketing Agency	Capacity in Kw: Under Construction	Additional Authorized or Initial	Total Ultimate
58	Falcon	Tex.	USBR	31,500	0	31,500
76	Gavins Point	S. D.-Neb.	USBR	100,000	0	100,000
82	Oahe	S. D.	USBR	170,000	255,000	425,000
83	Garrison	N. D.	USBR	240,000	160,000	400,000
89	Little Porcupine	Mont.	USBR	18,000	0	18,000
114	Alcova	Wyo.	USBR	36,000	0	36,000
138	Palisades	Ida.	USBR	114,000	0	114,000
155	Chandler	Wash.	USBR	12,000	0	12,000
171	Folsom	Calif.	USBR	162,000	0	162,000
174	Nimbus	Calif.	USBR	13,500	0	13,500
200	Eklutna	Alaska	USBR	30,000	0	30,000
139	Albeni Falls	Idaho	BPA	42,600	0	42,600
142	Lucky Peak	Idaho	BPA	0[1]	0[1]	0
148	Chief Joseph	Wash.	BPA	1,029,600	256,000	1,285,600
154	The Dalles	Wash.-Ore.	BPA	963,000	0	1,119,000
162	Lookout Point	Ore.	BPA	115,000	0	115,000
164	Dexter	Ore.	BPA	15,000	0	15,000
23	Old Hickory	Tenn.	Sepa.	100,000	0	100,000
27	Buford	Ga.	Sepa.	86,000	0	86,000
31	Jim Woodruff	Fla.	Sepa.	30,000	0	30,000
152	Cheatham	Tenn.	Sepa.	36,000	0	36,000
41	Table Rock	Mo.	SPA	84,000	84,000	168,000
51	Blakely Mt	Ark.	SPA	75,000	0	75,000
	Total (23 Plants)			**3,503,200**	**755,000**	**4,414,200**

AUTHORIZED PLANTS NOT

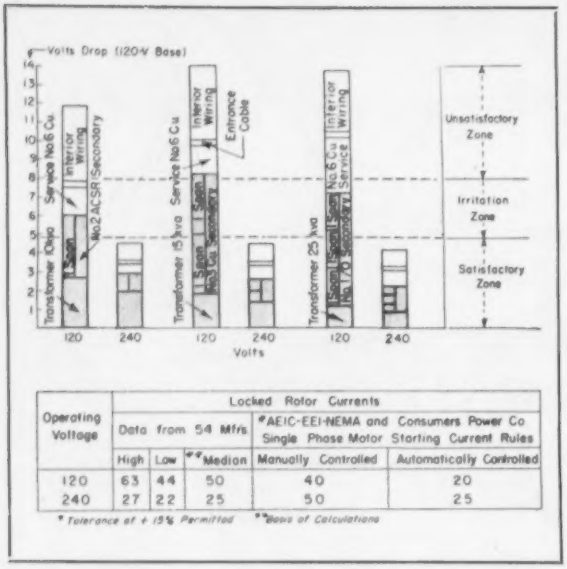
Map No.	Project or plant	State
201	Dear Creek	Utah
36	Red Rock	Ia.
38	Pomme de Terre	Mo.
40	Richland	Mo.
75	Harlan	Neb.
80	Big Bend	S. D.
81	Pony Hills (Miller Drop)	S. D.
85	Des Lacs	N. D.
86	Crosby	N. D.
88	Kenil	Mont.
90	Portage	Mont.
95	Absaraka (Mission)	Mont.
96	Lyon	Mont.
97	Yellowtail	Mont.
98	Bald Ridge	Wyo.
100	Hunter Mt.	Wyo.
103	Thief Creek	Wyo.
104	Sunlight	Wyo.
110	Tongue River	Wyo.
204	Glendo	Wyo.
205	Fremont Canyon	Wyo.
120	Big Thompson	Colo.
202	Moline	Colo.
203	Cameo	Colo.
134	American Falls	Ida.
135	Wanship	Utah
136	Gateway	Utah
170	Table Mt.	Calif.
173	Tiber	Mont.
206	Moorehead	Mont.
175	New Melones	Calif.
177	Delta (Steam)	Calif.
94	Libby	Mont.
144	Priest Rapids	Wash.
145	Lower Granite	Wash.
146	Little Goose	Wash.
147	Lower Monumental	Wash.
149	John Day	Wash.
151	Reza	Wash.



YET UNDER CONSTRUTION

			Marketing Agency	Capacity in Kw Authorized	Capacity in Kw Total Ultimate
156	Ice Harbor	Wash.	BPA	195,000	260,000
159	Hills Creek	Ore.	BPA	20,000	20,000
1	Youghioghney R.	Pa.	Sepa.	[1]	162,000
2	Summersville	W. Va.	Sepa.	[1]	115,000
3	Bluestone	W. Va.	Sepa.	105,000[2]	225,000
5	Gathright & Falling Springs	Va.	Sepa.	34,000	34,000
6	Salem Church	Va.	Sepa.	81,750	81,750
10	Moores Ferry	Va.	Sepa.	[1]	44,000
11	Falmouth	Ky.	Sepa.	[1]	90,000
12	Cave Run	Ky.	Sepa.	[1]	40,000
13	Jessamine Creek	Ky.	Sepa.	13,900	13,900
15	Booneville	Ky.	Sepa.	7,300	7,300
17	Celina	Ky.	Sepa.	64,800	64,800
21	Stewarts Ferry	Tenn.	Sepa.	13,500	13,500
22	Three Islands	Tenn.	Sepa.	9,000	18,000
25	Carthage	Tenn.	Sepa.	92,000	92,000
29	Hartwell	S. Car.-Ga.	Sepa.	180,000	180,000
30	Upper Columbia	Ga.-Ala.	Sepa.	65,000	130,000
33	Jones Bluff	Ala.	Sepa.	51,000	68,000
35	Millers Ferry	Ala.	Sepa.	57,000	76,000
176	Lower Cumberland[4]	Ky.	Sepa.	130,000	130,000
45	Water Valley	Ark.	SPA.	[1]	40,000
46	Lone Rock	Ark.	SPA.	[1]	90,000
47	Greers Ferry	Ark.	SPA.	[1]	96,000
48	Ozark	Ark.	SPA.	24,000	24,000
50	Dardanelle	Ark.	SPA.	120,000	120,000
53	McGee Bend	Tex.	SPA.	28,600	28,600
55	Dam "B"	Tex.	SPA.	[3]	2,935
56	Dam "A"	Tex.	SPA.	2,700	2,700
57	Rockland	Tex.	SPA.	13,500	13,500
60	Canyon	Tex.	SPA.	49,000	49,000
61	Belton	Tex.	SPA.	[1]	18,900
64	DeGray	Ark.	SPA.	32,000	32,000
66	Eufaula	Okla.	SPA.	90,000	90,000
67	Short Mountain	Okla.	SPA.	72,000	72,000
68	Webbers Falls	Okla.	SPA.	28,000	28,000
72	Markham Ferry	Okla.	SPA.	36,000	72,000
73	Oolagah	Okla.	SPA.	14,000	14,000
74	Keystone	Okla.	SPA.	60,000	60,000
	Total (78 Plants)			**6,424,050**	**7,934,485**
	USBR			5,000	5,000
	USBR			8,600	17,200
	USBR			[1]	7,000
	USBR			25,000	25,000
	USBR			1,200	1,200
	USBR			40,000	120,000
	USBR			60,000	180,000
	USBR			60,000	60,000
	USBR			48,000	48,000
	USBR			1,600	1,600
	USBR			20,000	20,000
	USBR			50,000	50,000
	USBR			24,000	24,000
	USBR			200,000	200,000
	USBR			30,000	30,000
	USBR			12,000	12,000
	USBR			60,000	60,000
	USBR			20,000	20,000
	USBR			25,000	25,000
	USBR			24,000	24,000
	USBR			48,000	48,000
	USBR			6,700	6,700
	USBR			5,000	5,000
	USBR			2,500	2,500
	USBR			30,000	30,000
	USBR			1,400	1,400
	USBR			4,000	4,000
	USBR			54,000	54,000
	USBR			2,000	2,000
	USBR			8,000	8,000
	USBR			37,000	37,000
	USBR			330,000	330,000
	BPA			618,000	618,000
	BPA			1,219,000	1,219,000
	BPA			165,000	220,000
	BPA			195,000	260,000
	BPA			180,000	240,000
Ore.	BPA			1,105,000	1,190,000
	BPA			10,000	10,000

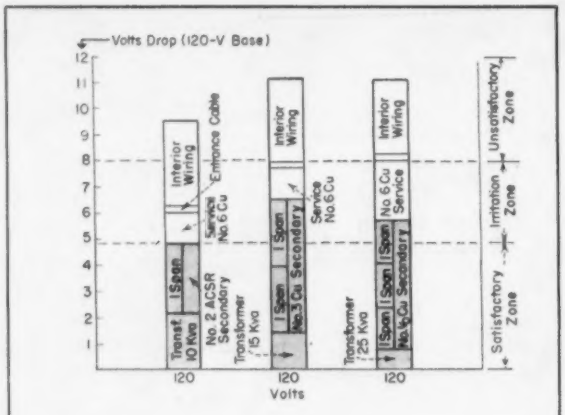
[1] Power not yet authorized. [2] Three units of 15,000 kw each at Stretcher Neck afterbay not yet authorized. [3] Dam under construction, installation of power facilities has been deferred. [4] Not yet authorized, proposed as substitute for Dever and Kuttawa.



Operating Voltage	Locked Rotor Currents				
	Data from 54 Mfrs			*AEIC-EEI-NEMA and Consumers Power Co Single Phase Motor Starting Current Rules	
	High	Low	**Median	Manually Controlled	Automatically Controlled
120	63	44	50	40	20
240	27	22	25	50	25

*Tolerance of ± 15% Permitted **Basis of Calculations

FIG 1—STARTING ¾-hp room air conditioners causes voltage flicker producing unsatisfactory conditions when the units operate at 120 v



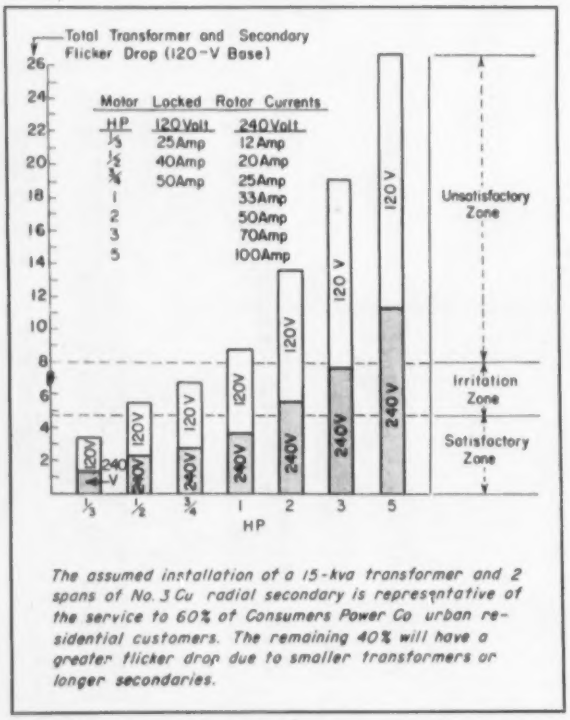
Operating Voltage	Locked Rotor Currents				
	Data from 54 Mfrs.			*AEIC-EEI-NEMA and Power Co. Rules	
	High	Low	**Median	Manually Controlled	Automatically Controlled
120	44	35	40	40	20

*Tolerance of ±15% Permitted **Basis of Calculations

FIG 2—EVEN ½-hp room air conditioners produce voltage flicker that results in unsatisfactory service when the units operate at 120 v

240-v Supply for Air Conditioning Reduces Voltage Flicker Problem

J. R. FREY, General Engineering Department, Consumers Power Co, Jackson, Mich.



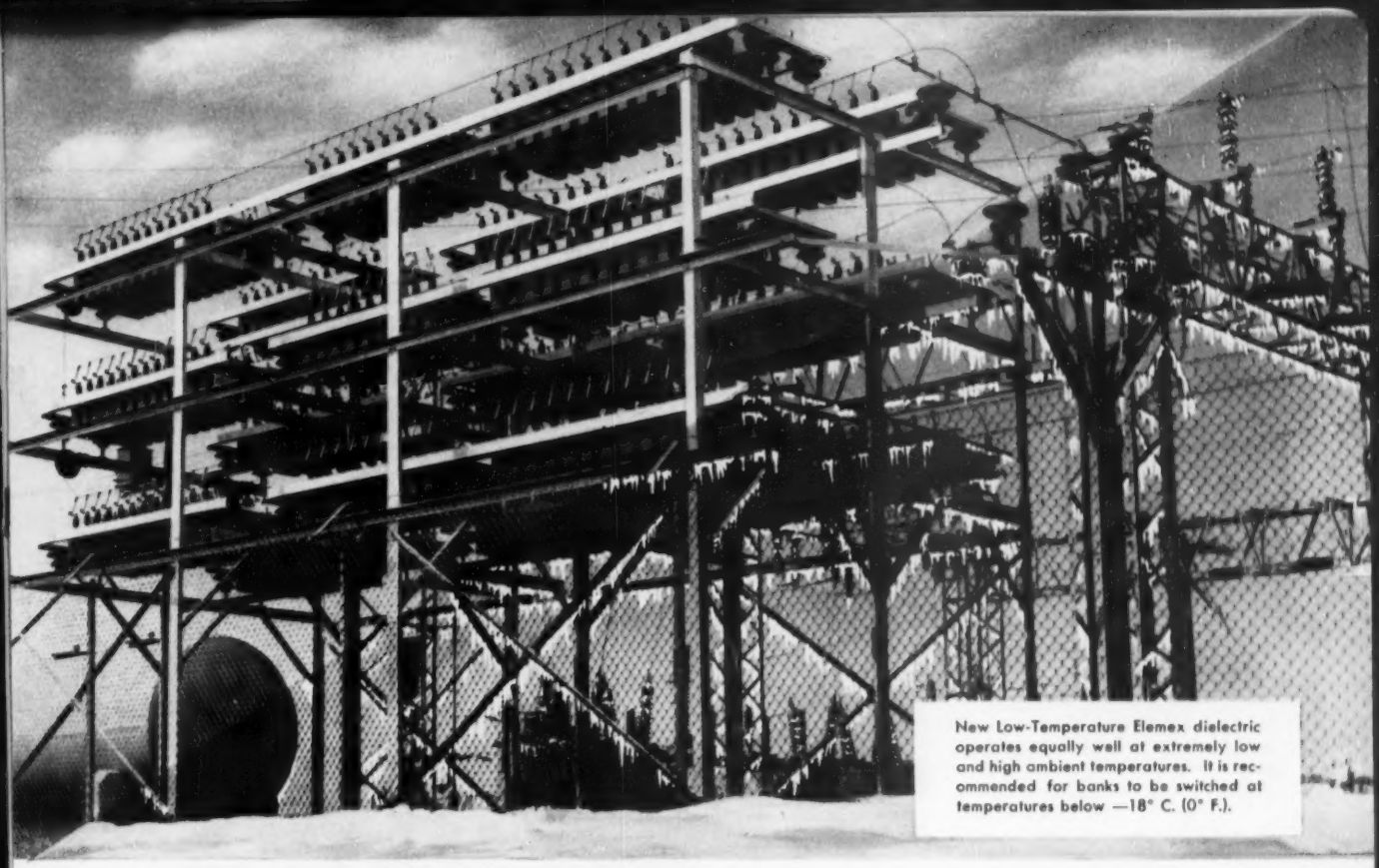
The assumed installation of a 15-kva transformer and 2 spans of No. 3 Cu radial secondary is representative of the service to 60% of Consumers Power Co urban residential customers. The remaining 40% will have a greater flicker drop due to smaller transformers or longer secondaries.

FIG 3—RADIAL SECONDARIES at 240 v can serve larger units, and secondary banking arrangements substantially reduce flicker voltages

Voltage flicker poses a problem for utilities serving residential air conditioning.

The accompanying charts, visualizing this problem, are based on calculations for fractional-horsepower motors supplied from typical overhead distribution systems with various transformer and secondary combinations. Values of locked rotor currents used in the calculations were obtained from a tabulation of the published values of 54 manufacturers and can be considered representative. Conclusions that may be drawn from the charts are as follows:

Story Continues on page 36 ➡



New Low-Temperature Elemex dielectric operates equally well at extremely low and high ambient temperatures. It is recommended for banks to be switched at temperatures below —18° C. (0° F.).

Switch Capacitors In Any Weather With New Low-Temperature ELEMEX®

When capacitors are continuously energized, they automatically maintain safe internal temperatures. But a switched capacitor that is disconnected from the line during low ambient temperatures is subject to congealing or freezing of the dielectric liquid, depending upon the length of time the capacitor is de-energized.

Energizing Warms Capacitor

If the dielectric reaches temperatures down to —18° C., re-energizing the capacitor will quickly warm the dielectric back to a safe operating temperature. But if the temperature drops below —18° C., and the capacitor is de-energized for some hours, the danger of failure is greatly increased, and the failure of some units in banks switched at these extreme low temperatures may be expected.

Users of standard Elemex capacitors have been especially fortunate in this respect because the flexible tank sides of Elemex capacitors do, to some extent, compensate for the contraction of the liquid at low temperatures and somewhat reduce the extent of voids in the congealed liquid.

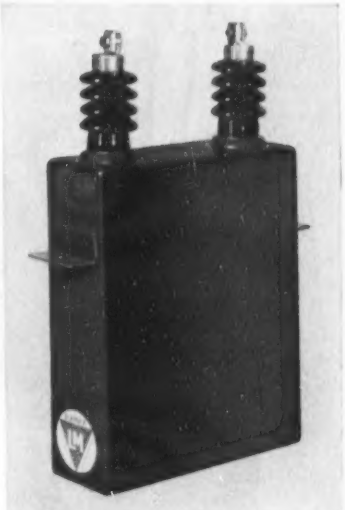
Lower Freezing Point Needed

But as switched installations increase, particularly in areas subject to extremely low temperatures, it is desirable to use a dielectric which can stand much lower ambient temperatures without congealing. Therefore capacitors with Low-Temperature Elemex liquid are now supplied upon request, without extra charge.

Low-Temperature Elemex remains liquid at very low temperatures. It can be safely used in switched installations with temperatures as low as —40° C. Also, Low-Temperature Elemex capacitors operate as satisfactorily under higher ambient temperature conditions as do those with standard Elemex.

Want Capacitor Application Data?

For complete information on the construction and application of Elemex Capacitors, ask the L-M Field Engineer for bulletins. L-M makes a wide variety of data available. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).



Elemex Capacitors offer many other desirable features—solder-sealed bushings with Paragroove connectors; exceptionally low rate of failure. Get details on their construction.

LINE MATERIAL

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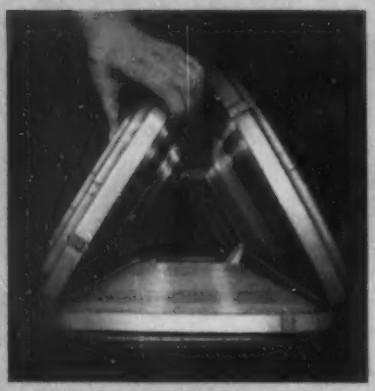
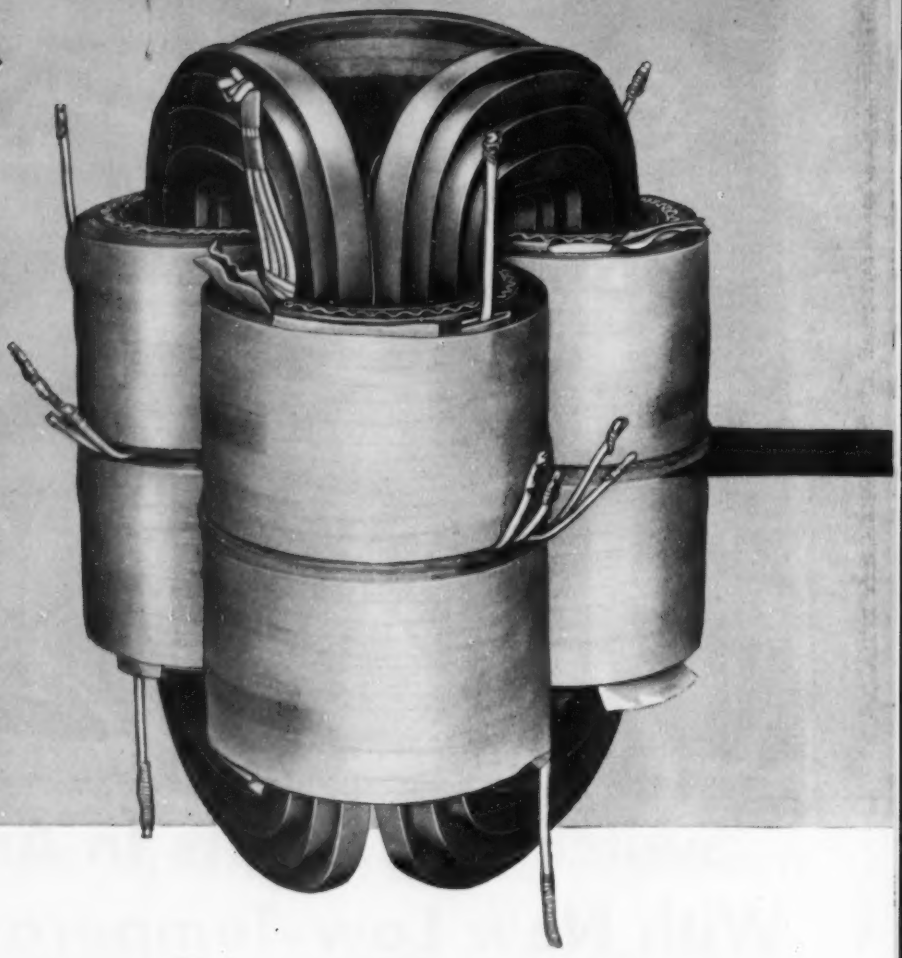
Elemex® Capacitors

"Elemex" is a registered trade-mark of the Line Material Company

The L-M Tri-Wound core-coil configuration results in a compact and highly efficient structure. The inherent characteristics of the continuously wound core and the round coils offer distinct design and operating advantages.



The core structure consists of three continuously wound cores of oriented-grain silicon steel strip assembled into a balanced magnetic unit.



The new Tri-Wound is built to resist short-circuit forces. Note the strong steel frame and heavy clamping bolts. Sturdy maple blocks at top and bottom are tightened and clamped against the coil ends to prevent axial movement.

Completed Tri-Wound 3-phase transformer. The unit is smaller and lighter than L-M's previous type. The transformer provides all the well-known advantages of L-M's single-phase Round-Wound transformers.

Outstanding Characteristics of L-M Tri-Wound Transformers

High short-time overload capacity

Good regulation at all power factors

High impulse level with ample creepage distance and generous insulation

High short-circuit strength

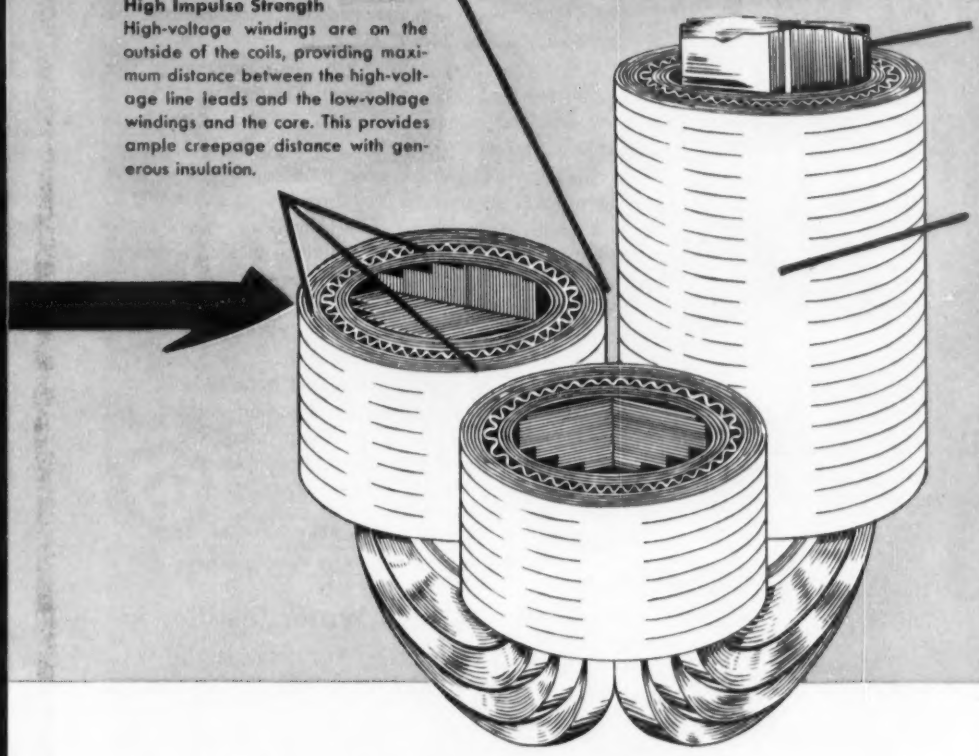
Filled with ORTO®, L-M's oxidation-resistant transformer oil, inhibited for longer life

Available in sizes 9, 15, 30, 45, and 75 kva

"Tri-Wound" and "Uni-Wound" are Line Material Company trade-marks.

High Short-Time Overload Capacity
Core clamps are designed to provide a chimney effect between the three coils. This chimney effect plus the exposed outer coil surfaces provides effective cooling. Oil ducts, located throughout the coil, contribute to uniform, efficient cooling.

High Impulse Strength
High-voltage windings are on the outside of the coils, providing maximum distance between the high-voltage line leads and the low-voltage windings and the core. This provides ample creepage distance with generous insulation.



Low Exciting Current
The continuously wound core of oriented-grain silicon steel strip provides a uniform flux path, thus permitting low exciting current.

High Short-Circuit Strength
Round coils naturally resist radial short-circuit forces without damage or distortion. Sturdy core clamps and strong blocking help prevent axial movement of the windings under short-circuit conditions.

For 3-Phase In 9 To 75 kva Sizes...

L-M's New Tri-Wound™ Transformers

Apply Round-Wound® principles to 3-phase construction to provide light weight and small size, high overload capacity, high short-circuit strength, high impulse strength.

By **JAMES G. EVERHART**
Chief Engineer
Transformer Division
Line Material Company

L-M's new *Tri-Wound* fills the need for a smaller, lighter 3-phase transformer that utilizes the full advantages of a continuously wound magnetic core and round coils. This new Tri-Wound transformer is now available in sizes 9 through 75 kva and in all voltage classes through 13,800 volts.

L-M's larger-sized 3-phase transformers are the new *Uni-Wound*, which provide Round-Wound's balanced performance in sizes from 112½ through 500 kva.

Continuously Wound Core

The Tri-Wound transformer consists of three cores, continuously wound of oriented-grain silicon steel strip. The bare cores are annealed after fabrication, and placed as shown in the illustration. Then round coils are wound directly onto the three core legs by L-M's exclusive winding process.

Tri-Wound is Smaller and Lighter

Integrating the core-coil assemblies into one unit provides a substantially lighter, smaller 3-phase transformer. For example, the 75 kva Tri-Wound is approximately 250 pounds lighter than previous designs. In addition, the over-all height of this new Tri-Wound unit has been reduced about 1½ feet, with very little increase in the projected floor space.

Balanced Performance

Performance characteristics of the Tri-Wound transformer have been coordinated to give good over-all balanced operation, with each characteristic being considered in its relationship to the over-all performance of the transformer.

Get Details of Tri-Wound Transformers

Ask the L-M Field Engineer to give you full details; or write Line Material Company, Transformer Division, Zanesville, Ohio. (Line Material Company is a McGraw Electric Company Division.)

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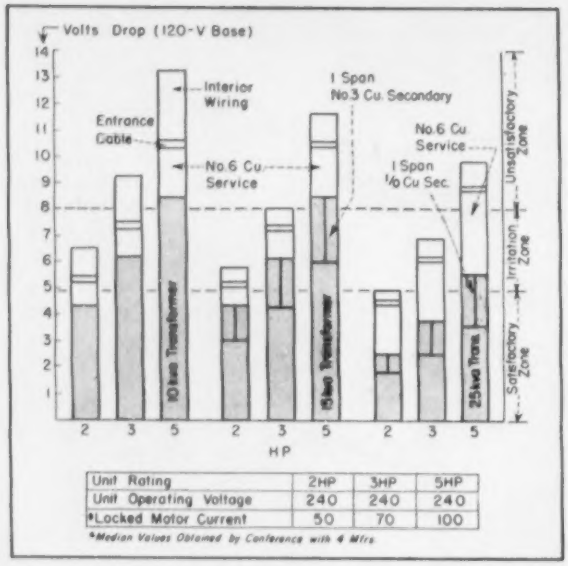
LINE MATERIAL Transformers



Unit Rating	2HP	3HP	5HP
Unit Operating Voltage	240	240	240
*Locked Motor Current	50	70	100

*Median Values Obtained by Conference with 4 Mfrs.

FIG 4—LARGER AIR CONDITIONERS cause less voltage flicker at 240 v than the smaller units cause when the latter are supplied at 120 v

1. A ¾-hp unit will produce excessive voltage flicker at 120 v, Fig 1.

2. Even a ½-hp unit can produce undesireable flicker at 120 v, Fig 2.

3. A ¾-hp unit will not produce excessive voltage flicker if supplied at 240 v, Fig 1.

4. A ½-hp unit, operated at 120 v, can cause as great a voltage flicker as a 2-hp unit-operated at 240 v. Likewise, a ¾-hp unit, operated at 120 v, can cause about the same flicker as a 3-hp unit operated at 240 v. Fig 3.

5. A single 15-kva distribution transformer is about the minimum size for serving a 2 or 3-hp unit at 240 v, Fig 4.

6. A single 25-kva distribution transformer is about the minimum size for serving a 5-hp unit at 240 v. Even for this case, secondary banking should be employed, Fig 4.

7. Certain conditions will permit the installation of single-phase motors in excess of 5-hp rating, especially if secondary banking is employed, Fig 4.

8. It is apparent that 240 v is far superior to 120 v service for supplying residential air conditioning equipment and that, for units in excess of ½ hp rating, the use of 240 v is mandatory if irritating voltage flicker is to be avoided.

New EEI Group

Prime Movers Committee adds subcommittee to study instrumentation and controls for steam stations

A new subcommittee to study instrumentation and controls for steam stations has been organized by the Edison Electric Institute Prime Movers Committee. Other details of the committee's May 3-4 meeting in Chicago, just released by the institute, concern cracking of stainless-steel main steam lines and maintenance of gage glasses.

The new subcommittee was established for the purpose of studying controls and instrumentation in the steam power field to determine and report on the best current practices. Chairman will be William Welch, Long Island Lighting Co, who also headed the temporary committee set up at the February meeting (EW, March 22, p 185) to study this matter.

Cracking of stainless steel in the main steam lines of a 1,050F, 1,800-psi turbine and the repairs effected were described by E. H. Krieg, Stone & Webster, chairman of the Metallurgy and Piping Subcommittee. After about one and a half years of service cracking was detected in the austenitic 18-8 Columbium stabilized steel piping, which was fabricated with a series of octagonal-shaped, forged and bored fittings. This resulted in radial changes in cross-sectional area at welds.

Although failures were ground out and repair welded, additional cracks requiring deeper grinding were discovered two years later. A companion unit of the same piping material but having rounded seamless forged fittings has operated for three years without cracking. Another utility having a unit similar to the one with cracked piping has reported no evidence of cracking in six joints recently examined.

Krieg pointed out that graphication continues to occur in certain stations, while other plants with apparently similar equipment and circumstances are not affected. Graphication in piping of one unit occurred after 50,000 service hours.

Results of a Boilers and Combustion Subcommittee survey show that certain types of gage glasses are apparently superior. Consensus of operating companies is that maintenance costs of other types are, in the main, excessive.

Optical means successfully used on a recent turbine job to realign bearings were demonstrated by Consolidated Edison Co. A special telescope and set of targets was used with excellent results.

Ocean Water Distillation Planned for PG&E Plant

Pacific Gas & Electric Co plans to install sea water evaporators to produce fresh water for boiler operations in its $44-million steam-electric generating plant under construction at Morro Bay, Calif.

Company officials believe it will be the first industrial application of ocean water distillation anywhere in the nation.

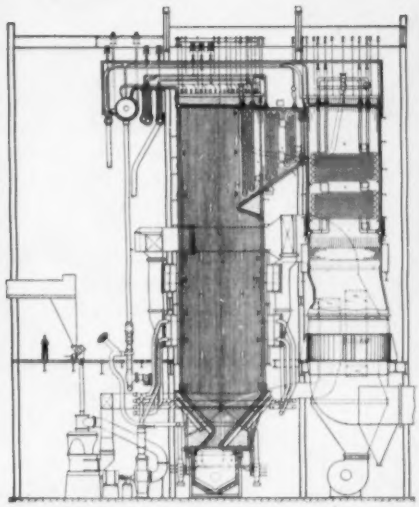
Designed by PG&E engineers and Bechtel Corp, contractor for the plant, each set of evaporators will have a fresh water production capacity of 50 gpm or 72,000 gpd. One set of evaporators will be installed on each of the two boilers.

According to Norman N. Sutherland, PG&E vice president and general manager, the decision to design salt water evaporators was reached after exhaustive studies into the fresh water supply in the area. For auxiliary use, there will be two wells.

Production of the evaporators can be controlled, and only enough fresh water will be made to satisfy plant needs. To produce 50 gal of fresh water, about 150 gal of sea water will be processed.

The first of Morro Bay's two 150,000-kw units will go into service next year, with the second scheduled for operation in 1956.

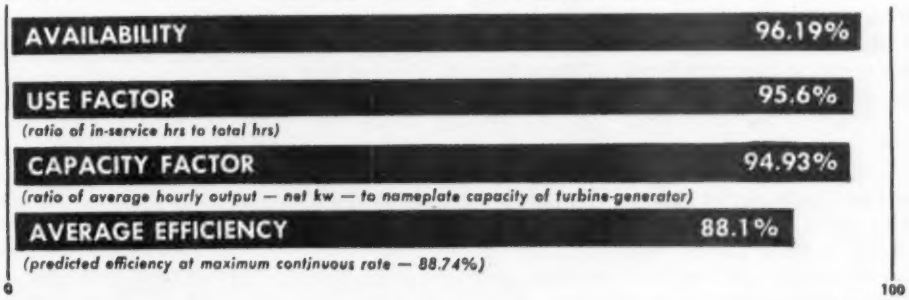
CONTROLLED CIRCULATION at CHESTERFIELD...



This Chesterfield boiler serves a 90,000 kw turbine-generator operating at a throttle pressure of 1450 psi with a primary steam temperature of 1000 F, reheated to 1000 F.

...1953 Operating Record

Since mid-1950, utility companies have ordered 43 C-E Controlled Circulation Boilers to serve an aggregate turbine capacity of 6,375,000 kw. Twelve of these boilers have been placed in service, the first of which went on the line on December 1, 1952, at the Chesterfield Power Station of the Virginia Electric & Power Company. Operating records of this boiler for the twelve-month period ending December 31, 1953 show the following principal results:



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COMBUSTION ENGINEERING

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.

BOILERS, FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

CLAY C. BOSWELL

M. L. HIBBARD

Boswell Heads Minnesota P&L

Former executive vice president succeeds M. L. Hibbard, who becomes chairman of the utility's board

Clay C. Boswell has been elected president and general manager of Minnesota Power & Light Co. The former executive vice president succeeds M. L. Hibbard, who was named chairman of the board and senior executive officer.

Minnesota P&L also announced the appointment of Axel H. Herbert as assistant to general manager. Herbert, Little Falls Division manager since 1947, will be replaced in the divisional post by Walter A. Grettum, superintendent of that division.

Boswell, a graduate of the University of Missouri, entered the utility field in 1915 when he joined Utah Power & Light Co as a substation and power plant operator and maintenance man. After service in France in World War I he returned to Utah P&L to become assistant to the commercial manager.

Served as Chief Engineer . . . Following several years employment with Electric Bond & Share Co, he went in 1929 to Minnesota P&L. He held the position of assistant chief engineer of the utility until 1934 when he became chief engineer. Two years later he was elected a director and a vice president in 1940. He was elected vice president and assistant general manager in 1950 and was appointed to the post of executive vice president in 1953.

Joined Minnesota P&L in '30's . . . Hibbard has been president and general manager of the company since he came to Duluth in 1933 from Boise, Idaho, where he was president and general manager of Idaho Power Co. Prior to his Idaho association, he had occupied executive posts with utilities in Fargo, N. D., San Antonio, Tex., and Minneapolis, Minn.

•

Glenn Koger has been named manager of the Torrance, Calif., plant of Rome Cable Corp. He has succeeded **Gilbert Woodill,** who has been acting manager of the plant for several months. Woodill recently was elected assistant treasurer of the company. Koger had been with General Electric Co for 19 years. In March, 1954, he joined Rome Cable.

George L. Beard, an engineer in the chief of the Army Corps of Engineers' office in Washington, D. C., since 1937, has been appointed assistant vice president of Pacific Power & Light Co. He will be in charge of the Portland, Ore., utility's long range hydroelectric planning and development program to supply power for the company's rapidly growing service area. Beard's latest Corps' assignment was the supervision of river basin planning and development throughout the U. S.

Clyde F. Boland has succeeeded Edward Wimberly as chairman of the South Carolina Public Service Commission.

H. G. Ray has been elected president of the Upshur-Rural Electric Cooperative Corp, Gilmer, Tex.

Richard A. Humphrey, who has been active for the past eight years in synthetic mica research, has been appointed chief of research and development at the Clifton, N. J., plant of Mycalex Corp of America, New York.

FRED J. BORCH

GE Designates Borch as VP of Marketing

Fred J. Borch has been elected a vice president of General Electric Co to succeed Vice President John L. Busey, who is on special assignments for Pres Ralph J. Cordiner.

Borch will serve as vice president of marketing and manager of the firm's Marketing Services Division with headquarters at New York.

He joined GE's Lamp Division at Nela Park in 1931. For the past year he has headed a business survey study in that division.

(*More Personals on page* 43)

Oscilloscope trace indicates ionization of this power cable.

4 AWG stranded 3/c RoZone® insulated, shielded, RoPrene sheathed power cable, 5000 volts.

How we prevent trouble *before* trouble begins

The instrument, pictured above, is your assurance of maximum protection against one of the most insidious of cable hazards . . . ionization.

Ionization, which is the electrical break-down of air in pockets within the insulation, or between insulation and conductor or shield, often causes several destructive electrical effects. Included are possible ozone cutting, reduced dielectric strength and increased dielectric loss . . . any or all of which may result in reduced cable efficiency and early failure.

Perhaps the most hazardous thing about ionization is that ordinary visual, physical and electrical tests will not show evidence of it.

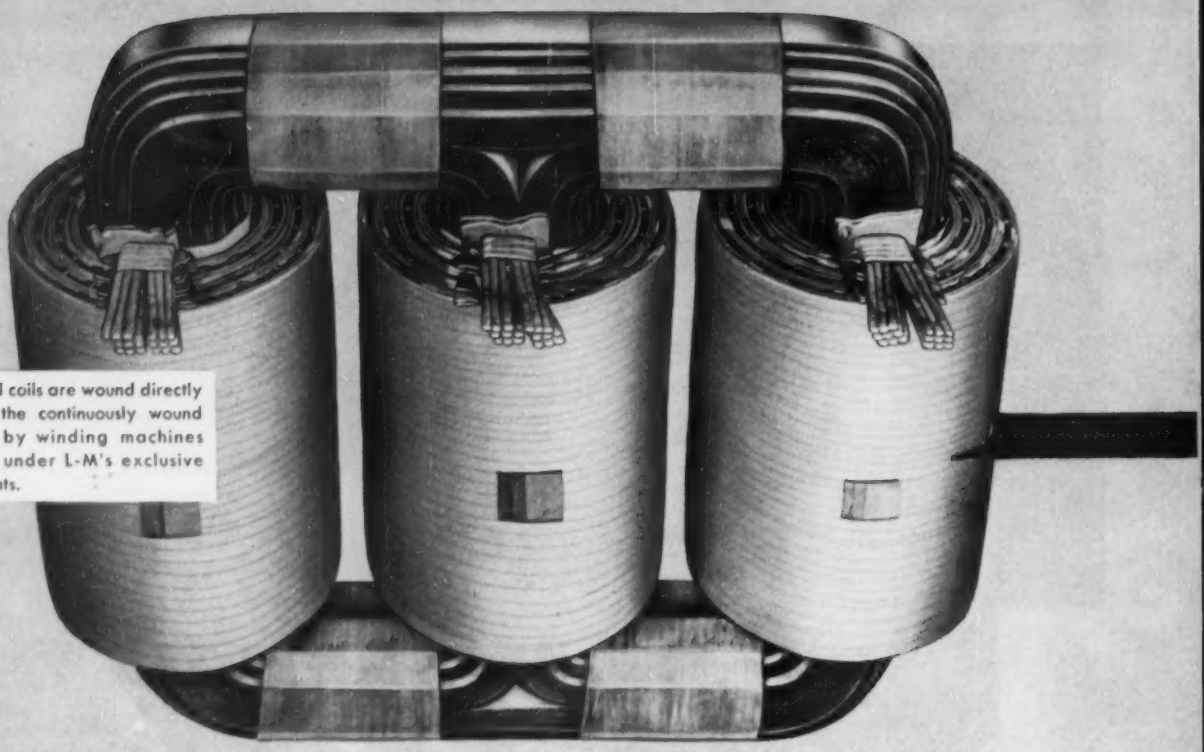
But you can count on maximum protection against ionization when you specify Rome insulated cables. *Every foot of every cable rated at 3000 volts or over is thoroughly tested by this specially designed ionization detector.*

This completely new NONDESTRUCTIVE testing method accurately measures the corona level of the entire cable. This extra step in Rome Cable's standard manufacturing procedure was developed by Rome engineers and was first described in AIEE paper 48-198, "The Measurement and Investigation of Ionization Level of Rubber Insulated Cables," presented in August, 1948. A copy is yours for the asking —check and fill in slip below.

ROME CABLE Corporation
ROME • NEW YORK
and
TORRANCE • CALIFORNIA

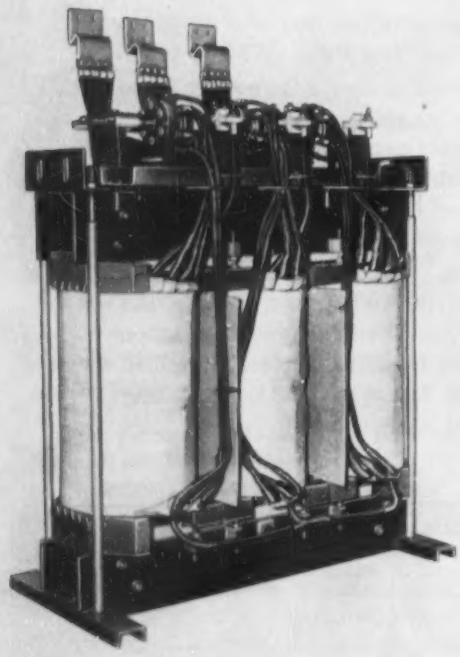
ROME CABLE CORPORATION, Dept. WN-8, Rome, N. Y.
Please send me a copy of....The Measurement & Investigation of Ionization Level....Rome Power and Control Cable Catalog.

Name .....
Company .....
Adress .....
City .....Zone....Stae.....

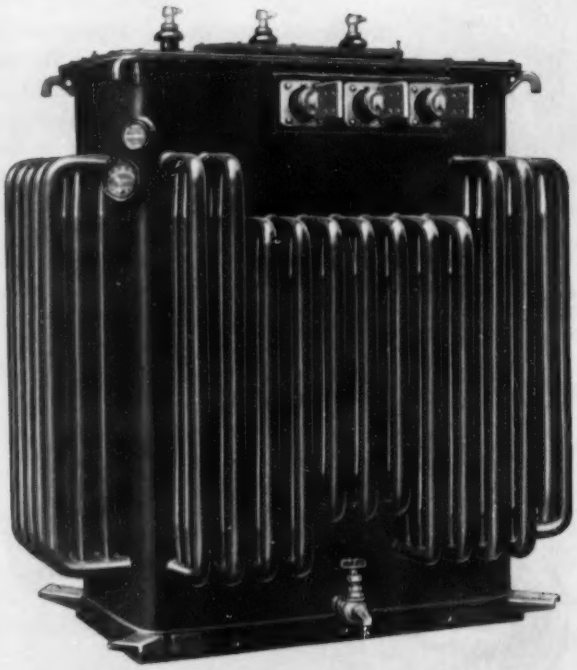


Round coils are wound directly onto the continuously wound core by winding machines built under L-M's exclusive patents.

L-M Announces New Uni-Wound® 3-Phase

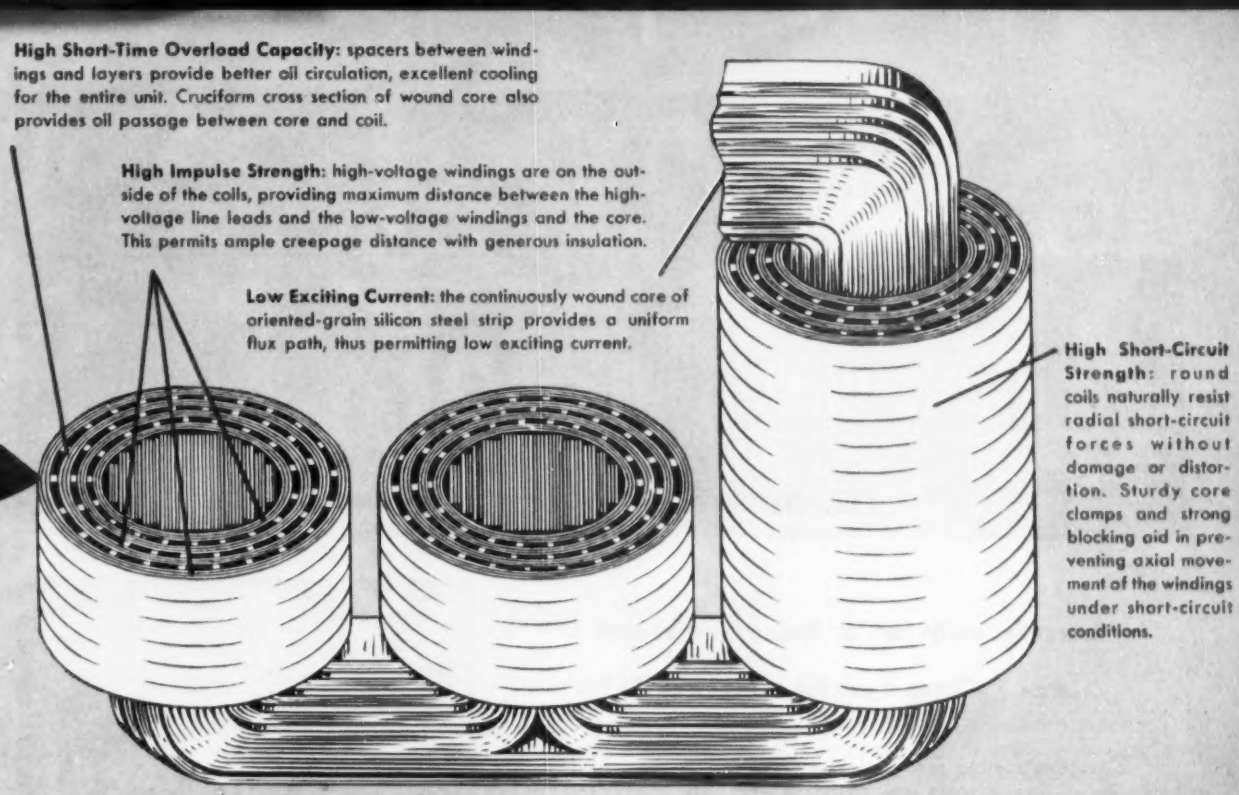


Core-coil assembly for a 500 kva Uni-Wound transformer. The sturdy core clamping frame and strong blocking contribute to high short-circuit strength.



Completed 500 kva Uni-Wound 3-phase transformer. The unit is smaller, shorter, and lighter than L-M's previous type. The transformer provides all the well-known advantages of L-M's single-phase Round-Wound transformers.

"Uni-Wound" and "Tri-Wound" are Line Material Company trade-marks.


High Short-Time Overload Capacity: spacers between windings and layers provide better oil circulation, excellent cooling for the entire unit. Cruciform cross section of wound core also provides oil passage between core and coil.
High Impulse Strength: high-voltage windings are on the outside of the coils, providing maximum distance between the high-voltage line leads and the low-voltage windings and the core. This permits ample creepage distance with generous insulation.
Low Exciting Current: the continuously wound core of oriented-grain silicon steel strip provides a uniform flux path, thus permitting low exciting current.
High Short-Circuit Strength: round coils naturally resist radial short-circuit forces without damage or distortion. Sturdy core clamps and strong blocking aid in preventing axial movement of the windings under short-circuit conditions.

Transformers in 112½ to 500 kva Sizes

Provides advantages of L-M Round-Wound® core construction in 3-phase transformers in sizes from 112½ through 500 kva. They're lighter, smaller, have improved overload capacity, high impulse level, high short-circuit strength.

By **ALVIN B. COYLE**
Manager,
Transformer Sales
Line Material Company

L-M Round-Wound construction consists of a continuously wound core, with round coils wound directly onto the core. This design has a number of advantages in improved performance and better mechanical strength.

Uni-Wound Fills Need

Now L-M engineers have developed a 3-phase transformer with all the advantages of Round-Wound construction. This is the new *Uni-Wound* transformer, which is now in production in sizes from 112½ through 500 kva, and in voltages through 13,800. In smaller 3-phase sizes L-M offers the new *Tri-Wound* transformer.

Continuously Wound Core

The Uni-Wound transformer consists of a unitary core, continuously wound of oriented-grain silicon steel strip. The bare core is annealed after winding. Then round coils are wound directly onto the three core legs by L-M's exclusive winding process.

All Other Round-Wound Advantages

Thus all of the inherent characteristics of the single-phase Round-Wound transformer are provided in the 3-phase Uni-Wound. These advantages include:

high short-time overload capacity
uniformly high impulse strength
high short-circuit strength
low exciting current
lighter weight • smaller size

Uni-Wound Lighter, Lower

The 500 kva Uni-Wound is about 1200 pounds lighter than the stacked lamination type. The 112½ kva, 2400 volt delta Uni-Wound is about 400 pounds lighter than the 112½ kva Triplex style. These lighter weights permit single-pole mounting of sizes through 150 kva instead of the 2-pole platform construction previously required. In some sizes, the over-all height has been reduced as much as two feet, with but little increase in projected floor space.

Balanced Performance

Both the physical and performance characteristics have been well balanced in the Uni-Wound 3-phase transformer design. Just as with the single-phase Round-Wound, no one characteristic has been emphasized at the expense of another. No one characteristic has been considered exclusively by itself, but only in its relationship to the over-all performance of the transformer.

Get Details on Uni-Wound Transformers

Ask the L-M Field Engineer to give you full details; or write Line Material Company, Transformer Division, Zanesville, Ohio. (Line Material Company is a McGraw Electric Company Division.)

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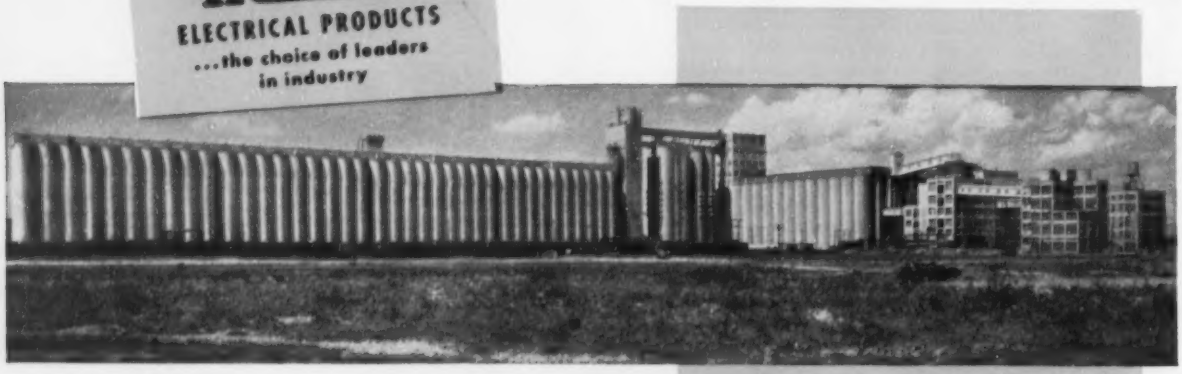
LM® LINE MATERIAL Transformers

Wagner
ELECTRICAL PRODUCTS
...the choice of leaders in industry



Look what's happened to "Green Manure"

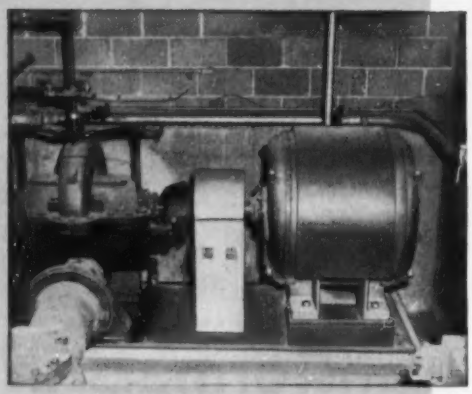
America's most rapidly increasing crop is the soybean. Just 30 years ago, soybeans were called "green manure"—considered of value only as a soil-building legume. But, today, soybeans are our fourth ranking grain crop... more than a quarter billion bushels were harvested last year.

The A. E. Staley Manufacturing Company, at Decatur, Illinois, is the world's largest combined processor of corn and soybeans. At the giant 108-building plant shown above, soybeans are converted into soybean oil and meal... to become a major ingredient in scores of products from shortenings and margarines, stock feeds and medicines to paints, plastics, textiles and linoleum.

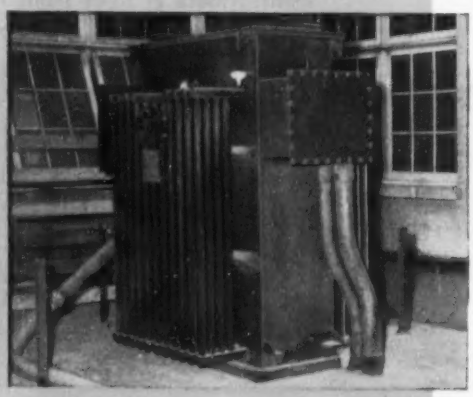
Electricity is, of course, the source of power for this processing. And at the Staley plant, power is supplied through Wagner Transformers—delivered to Wagner Motors that drive the conveyors, agitators, flaking rolls and other equipment.

Wagner Electrical Products are the choice of many leaders of industry because Wagner has a reputation for building quality products that do their jobs dependably and economically.

Let a skilled Wagner engineer discuss your motor and transformer needs with you. Call the nearest of our 32 branch offices, or write us direct.



This 150 hp Wagner Type RP Motor drives a cooling tower pump at the A. E. Staley plant.



This 750 kva Wagner Substation Transformer is fed from a substation containing two 5000 kva Wagner Power Transformers.

Wagner Electric Corporation
EST. 1891

WAGNER ELECTRIC CORPORATION
6456 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

WE54-7

H. H. WATSON

EARL EWALD

NSP Advances Watson, Ewald

Northern States Power Co has named H. H. Watson vice president and assistant to the president. His successor as vice president in charge of operation is Earl Ewald, formerly manager of operations for the utility.

Watson has had more than 40 years' experience in the utility field. He started with H. M. Byllesby & Co in 1911, working at its various properties in Colorado, Tennessee, and Arkansas. Following military service in 1918, he returned to his engineering post in Arkansas, later becoming a construction superintendent for NSP.

Construction Background . . . Watson was general superintendent of construction for the San Diego Consolidated Gas & Electric Co for ten years. He returned to Northern States Power in that capacity in 1932, becoming manager of electric operations eight years later. He was elected to the position of vice president in charge of operation in 1951.

Ewald's career with NSP began in 1932. After filling several distribution engineering positions, he became manager of electric operations in 1951. Last September he was made manager of operations for the company.

Alabama Power Elevates E. A. Wilson, 2 Others

E. A. Wilson, assistant sales manager of Alabama Power Co, has been advanced to general sales manager, reporting to Vice President E. C. Easter.

With the separation of the functions of the rates and rural section, J. R. Lester, who has been manager of rates and rural sales, has been promoted to manager of rates and market research, reporting to Vice President Easter.

M. B. Penn, who has been chief agricultural engineer, has been named manager of rural sales.

Wilson began with Alabama Power as a draftsman in 1917. He transferred to industrial power sales, becoming manager of the Industrial Power Division before becoming assistant sales manager in 1952.

E. A. WILSON

Lester became affiliated with the utility in 1919 when he started as a substation maintenance crew member. Penn joined the company in 1926 as a junior engineer.

FP&L Names McDonald, Blaylock to New Posts

Malcolm B. McDonald, secretary and director of advertising and publicity of Florida Power & Light Co, has been appointed a vice president of the company.

The newly elected official will continue his advertising and publicity duties. However, W. F. Blaylock, former assistant to the president, will assume the post of secretary.

McDonald became affiliated with Florida P&L in 1926 when he started as a clerk in the company's sales department. Later he served as secretary to the president, then assistant to the president and secretary of the utility.

•

Frank M. Lewis, Bonneville Dam project engineer the past eight years, has been named coordinator of operations and maintenance of multi-purpose projects in the North Pacific Division of the Army Corps of Engineers. He moves to the new job Sept. 1. An electrical engineer, he joined the Corps in 1935.

OBITUARY

Edward J. Hyland

Edward J. Hyland, 63, vice president of Boston Edison Co, died July 31 at Scituate, Mass. Hyland was an assistant professor of accounting at Boston University before joining Boston Edison in 1938 as comptroller and assistant treasurer. He served as treasurer before becoming a vice president in 1952.

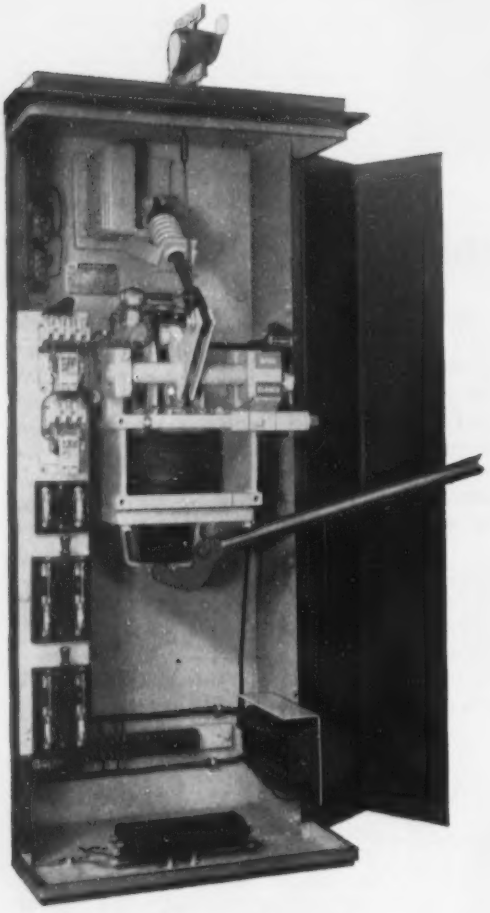
Ralph E. Robida, 64, who retired last year as general superintendent of operations for the Niagara area of Niagara Mohawk Power Corp, died July 27 in Buffalo, N. Y. He entered the utility field in 1910.

Robert C. Thompson, 42, chief engineer of the Control Division of Electric Machinery Manufacturing Co, Minneapolis, died there July 14. An electrical engineer, Thompson was employed by Interstate Power Co before joining Electric Machinery in 1941.

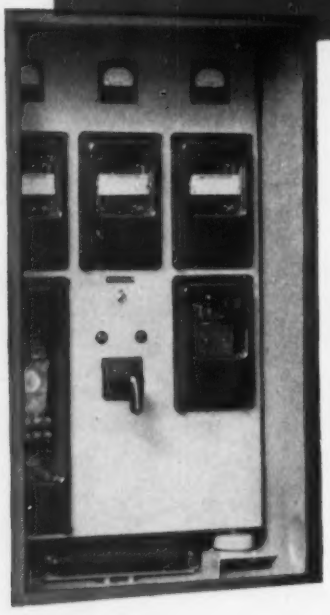
If You Worked on Breakers....

this is the breaker you'd buy!

The minute you open the operating cabinet you have the story. Clean design! Everything you ever wanted to get at for any reason is right out in the open. Check a few of the many features of this outstanding breaker, then GET COMPLETE INFORMATION! Call your nearby A-C district office, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-6253



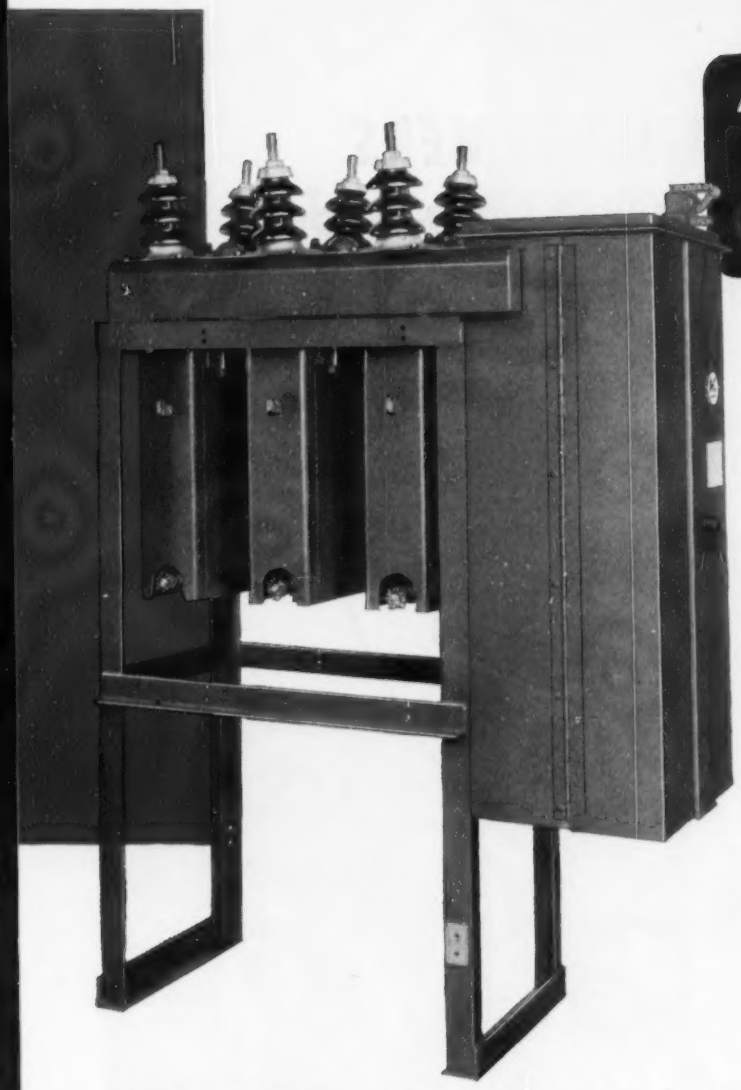
ROOMY OPERATOR CABINET. Access to operator is unrestricted. Operator is high speed solenoid type—mechanically and electrically trip-free. Side hinging of L-shaped doors allows access to operator cabinet from three sides. Only 7 inches of clearance needed in front of cabinet to open doors.



RELAY CABINET. Relays when specified are in separate cabinet, which can be secured against unauthorized personnel. Relay panel is fixed. This eliminates troublesome hinge wiring. Door at rear provides access to back of relays. Panel is shock-mounted at four points so relay contacts are not operated accidentally by breaker vibration or slamming of cabinet door.

A-C ALLIS-CHALMERS

ALLIS-

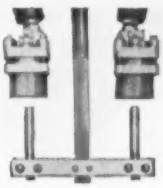


ALLIS-CHALMERS 14.4-kv Oil Circuit Breakers

TANK-PER-PHASE construction — as used in large breakers — has high safety factor. It completely isolates phases and eliminates possibility of internal phase-to-phase flashover. A maximum of 12 gallons of oil in each tank makes it a simple matter to raise and lower tanks.

VISIBILITY PLUS — external position indicator easily visible at a distance from front or side. Contact position indicator also provided inside. In addition, maintenance closing device is side operated. Man closing breaker can observe contacts and man working on them.

DOUBLE BREAK per phase principle is used with time-proved *Ruptor* interrupting devices. Self-wiping, self-aligning tulip and bayonet contacts are used. Here again, Allis-Chalmers provides the same quality construction as is used on large A-C breakers.



NO BURIED LEADS. No more conduits, pipes and fittings! To get at bushing current transformer leads, simply remove 3 pins at bottom of fabricated wiring duct and remove bottom plate. This is typical of the well-engineered features that make this breaker outstanding in its field.

Ruptor is an Allis-Chalmers trademark.

BREAKER RATINGS (8-Cycle Standard Interrupting Time)

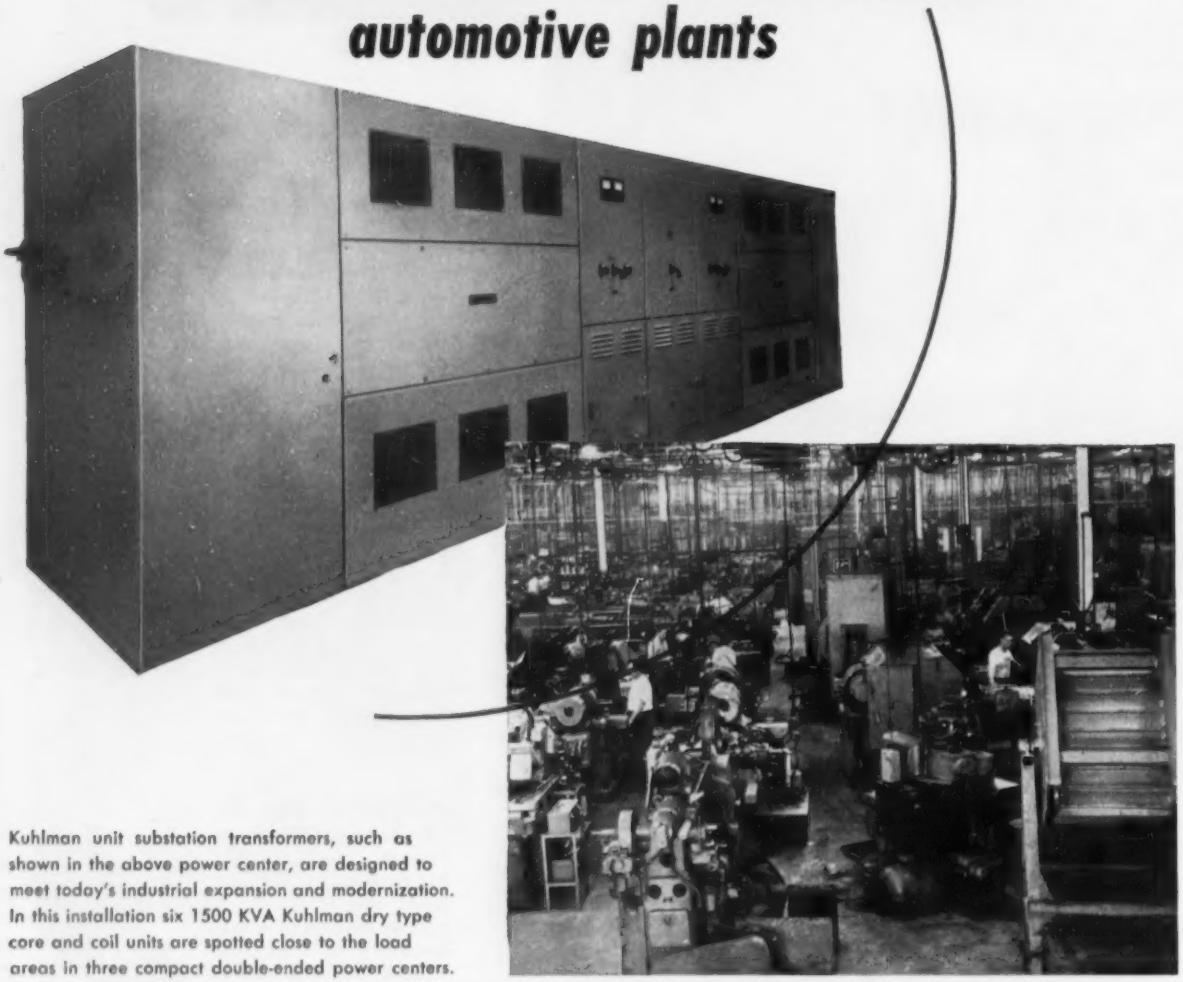
Type	Rated Kv	Rated Amps	INTERRUPTING RATING RMS TOTAL AMPERES At Rated Volts	Maximum Rating	Kva	Weight of Breaker With Oil (lbs)
OZ-15-100	14.4	600	4,000	15,000	100,000	2,350
OZ-15-250	14.4	600	10,000	25,000	250,000	2,370
OZ-15-250	14.4	1200	10,000	25,000	250,000	2,470
OZ-23-250	23	600	6,300	12,000	250,000	2,370

CHALMERS

KUHLMAN

POWER CENTER TRANSFORMERS

in one of America's largest ultra-modern automotive plants



Kuhlman unit substation transformers, such as shown in the above power center, are designed to meet today's industrial expansion and modernization. In this installation six 1500 KVA Kuhlman dry type core and coil units are spotted close to the load areas in three compact double-ended power centers. Each power center contains two identical core and coil units, one serving as a right hand unit and the other, turned 180°, serving as a left hand unit.

Kuhlman Electric Company, employing the most advanced engineering and construction methods, can supply power center core and coil units or the complete transformer sections with enclosure. Forced air cooling may be added to increase the KVA capacity for either peak load conditions or plant expansion.

Be sure to specify Kuhlman power centers when planning your plant's expansion or modernization program.

KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH STREET, N. Y. 7, N. Y. CABLE ADDRESS: MICROPHONE, N. Y.

SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

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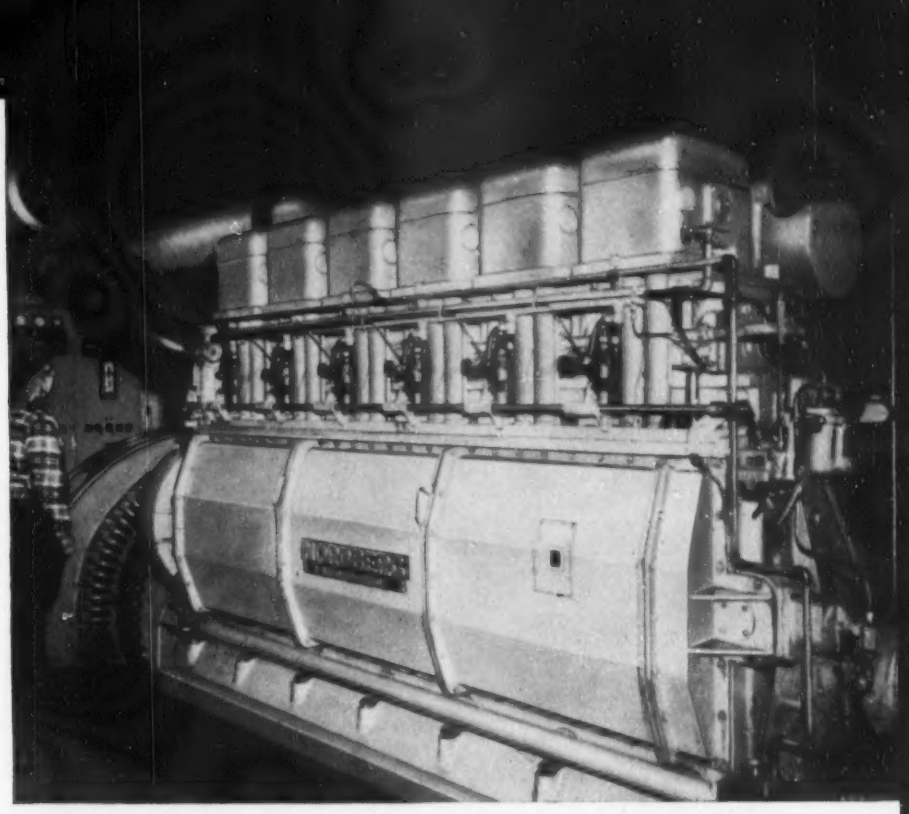
Mackinac Island and St. Ignace requiring more locally generated power to supplement 66-kv line to assure service reliability, peaking, and standby, Edison Sault Electric—



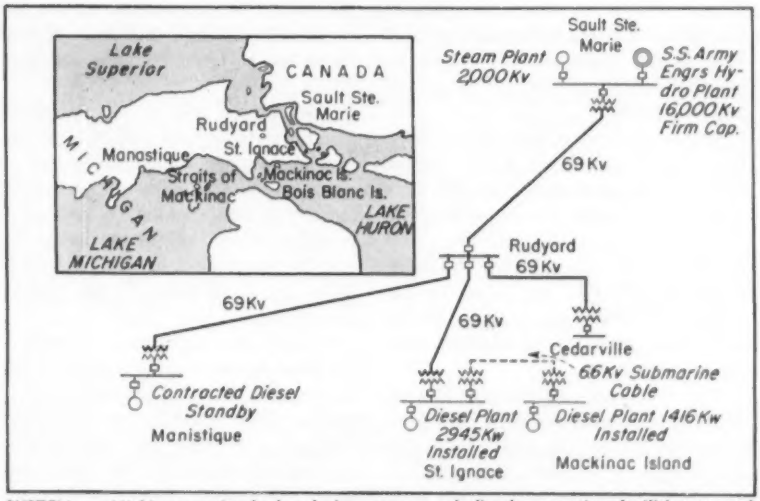
MACKINAC ISLAND'S 1,200-hp, 4-cycle diesel maintained regular service there when damage to single 6,600-v submarine cable left the island without the supply from the mainland

Installs 2 Diesel Generator Units

Diesel generators at Mackinac Island and St. Ignace, Mich., assure service reliability in those areas and provide peaking and supplementary supply for the Edison Sault Electric Co's system.

Bulk of the company's power is purchased from the U. S. Army Engineers at the hydroelectric plant of the Sault Ste. Marie locks. Available firm capacity from this source is 16,000 kw. A small company steam plant at Sault Ste. Marie provides an additional 2,000 kw in that area. Transmission from this source to St. Ignace and Mackinac Island, however, is only a single-circuit, 66-kv line.

The advantage of the enlarged Mackinac Island diesel plant was demonstrated last December, when damage to the 6,600-v submarine cable from St. Ignace disrupted the normal source of electricity. During the eight days the cable was out, elec-



SYSTEM on Michigan peninsula has hydro, steam, and diesel generating facilities teamed to supply electrical needs. Army plant at Sault Ste. Marie locks supply bulk of power

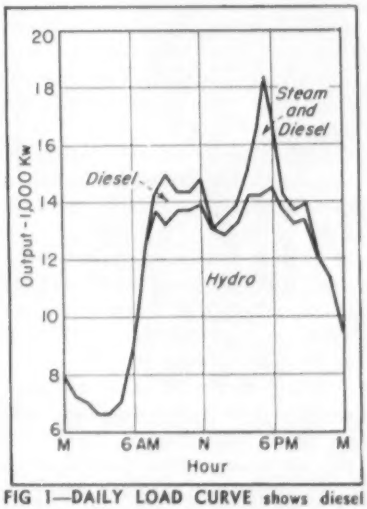
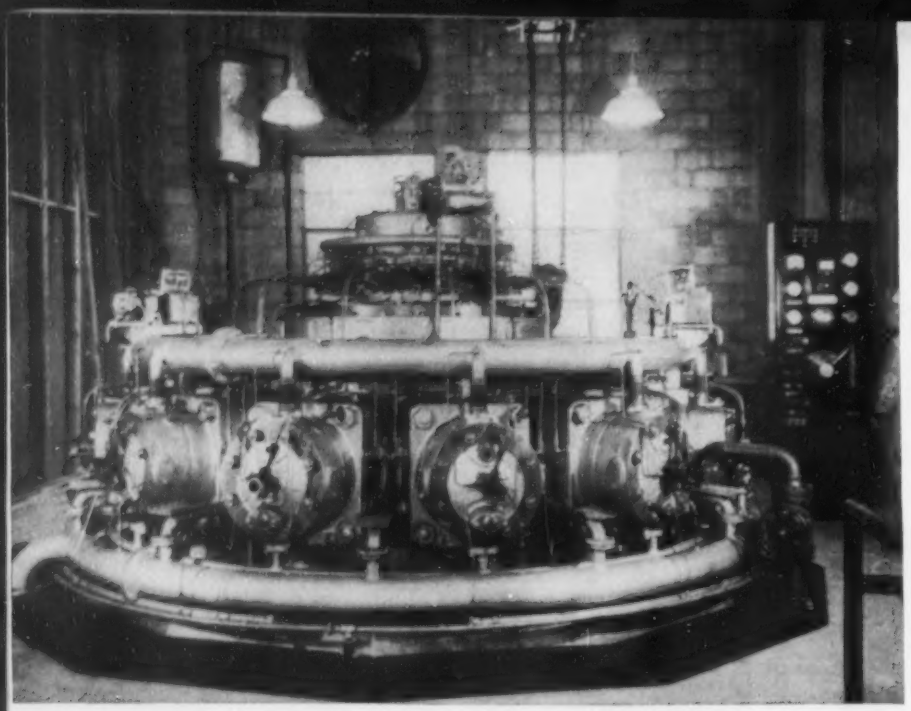


FIG 1—DAILY LOAD CURVE shows diesel and steam generation for peak loads periods



ST. IGNACE'S 12-cylinder, radial diesel now serves more as a base load unit although it was first intended for peak and standby. The unit is rated at 2,025 hp and 1,440 at kw

tricity for Mackinac Island was provided by the insular plant.

Mackinac Island Plant Augmented . . . System studies had shown the need for additional generation at both points. Late last year a 1,200-hp, 4-cycle diesel engine driving an 840-kw, 450-rpm generator was installed. This unit supplements three existing units, totaling 576 kw.

St. Ignace Gets New Diesel . . . An addition also was made to the diesel plant at St. Ignace. Here a new 2,025-kw radial engine was installed to drive a 1,440-kw generator at 400 rpm. This engine has twelve 14-by-16-in. cylinders operating on a 2-stroke cycle. Intention was to operate the new St. Ignace unit for peak load and standby only.

But as month followed month, this installation has been used more and more as a base load plant. As of last Feb. 1, it had operated 2,100 hr or 29% of total time since its initial start. It has generated 1,353,600 kwhr. During the first 23 days of February, 1954, the unit operated 137.5 hr or 24% of the time.

Before installation of the radial engine, the plant at St. Ignace had 1,500-kw in six units ranging from 60 to 500 kw each. These were three 2-cycle, mechanical injection diesel engines driving generators with a combined capacity of 360 kw, installed in 1922; a 4-cycle, air-injection diesel driving a 160-kw generator; and, two 2-cycle, air-injection diesels, each driving a 500-kw generator. The 500-kw units are used in regular operation, together with the new 1,440-kw radial, to supplement the main hydro supply.

St. Ignace Design . . . The new radial engine-generator unit is installed in an addition to the St. Ignace power plant building. Generator and exciter are on the ground floor, and the engine proper is on the second floor. As this unit was originally planned for intermittent service, an electric strip heater was installed in the bottom of the steel support for generator and engine to eliminate moisture damage to generator windings.

Engine cooling is accomplished by pumping water from Lake Huron through the shell-and-tube, lubricating-oil and jacket water coolers. A thermostatic controlled bypass valve on the jacket water cooler regulates the temperature of the water to the engine. A single water pump circulates water through the closed jacket cooling system.

The 200-hp scavenging-blower motor is connected directly to the generator terminals. On starting up the station battery provides full field on the generator exciter. When the generator voltage builds up to a predetermined point, the exciter field is disconnected from the battery and reconnected for shunt operation by relays. This method of starting the blower motor has proved very successful.

Auxiliaries and Fuel . . . All engine auxiliaries, including fuel and lubricating-oil pumps, lubricating-oil tank, fuel-oil filters and pumps, and starting-air tank and compressor, are on the ground floor. Lubricating oil from the engine is passed through a full-flow filter and a magnetic separator before returning under pressure to the lubricating system in the unit.

Fuel for both the St. Ignace and Mackinac Island plants is a 30 API gravity product obtained from Michigan refineries. Fuel cost at the St. Ignace plant has averaged 10.73¢ per gal during the six-month period from August 1953, through January 1954.

System . . . In an area roughly forming a triangle among Sault Ste. Marie, Manistique, and St. Ignace, the Edison Sault Electric Co supplies demands that are extremely variable primarily because of the influx of tourists in the summer months.

For example, use of electricity on Mackinac Island is greatest in the summer when demand reaches about 800 kw. During the winter this demand drops to about a quarter of that value. At St. Ignace on the north shore of the Mackinac Straits the fluctuation is not so pronounced because of the all-year operation of ferries across the straits and the railroad, truck, and auto traffic between northern and southern Michigan at this point. But St. Ignace also shows the summer tourist influence in its restaurants, hotels, novelty shops, and boat docks.

The eastern end of the Michigan peninsula, besides its fine fishing and hunting, supports such industries as paper making, leather processing, lumbering, and farming. In this area, Sault Ste. Marie, site of the American and Canadian locks between Lake Superior and Lake Huron, is the leading community.

Through the locks pass an endless stream of boats carrying iron ore from the Mesabi range to Eastern refining centers. The Soo Line Railroad has a terminal at Sault Ste. Marie, and this, together with a leather processing plant, contributes to the community's industrial activity.

it's time for a new meter...

when Mrs. Riley...

gets her electric range

Since the day she took up the role of homemaker, Edith Riley has had a gas stove, of one kind or another, in her kitchen. But times have changed, and, well . . . the Rileys are getting an electric range this time.

The Rileys, and the thousands of American families like them who are turning to electricity to do more and more things, are going to need high capacity meters.

There is a new extended range meter on the market that will easily handle the heavier loads created by the rapidly increasing use of electricity. It's the Sangamo J2, a 15 ampere meter with straight-line accuracy up to 100 amperes. As a matter of fact, the J2 has the capacity to carry 100 amperes *continuously* without overheating, yet it has sufficient torque to accurately measure even the lightest load.

When you invest money in meters you know are going to have to handle greater and greater loads, protect your investment by choosing a meter with plenty of reserve ability to measure the growing use of electricity.

Choose the new Sangamo J2—the first . . . and finest . . . 15 ampere meter with 100 ampere capacity.

A METER WITH STRAIGHT LINE ACCURACY

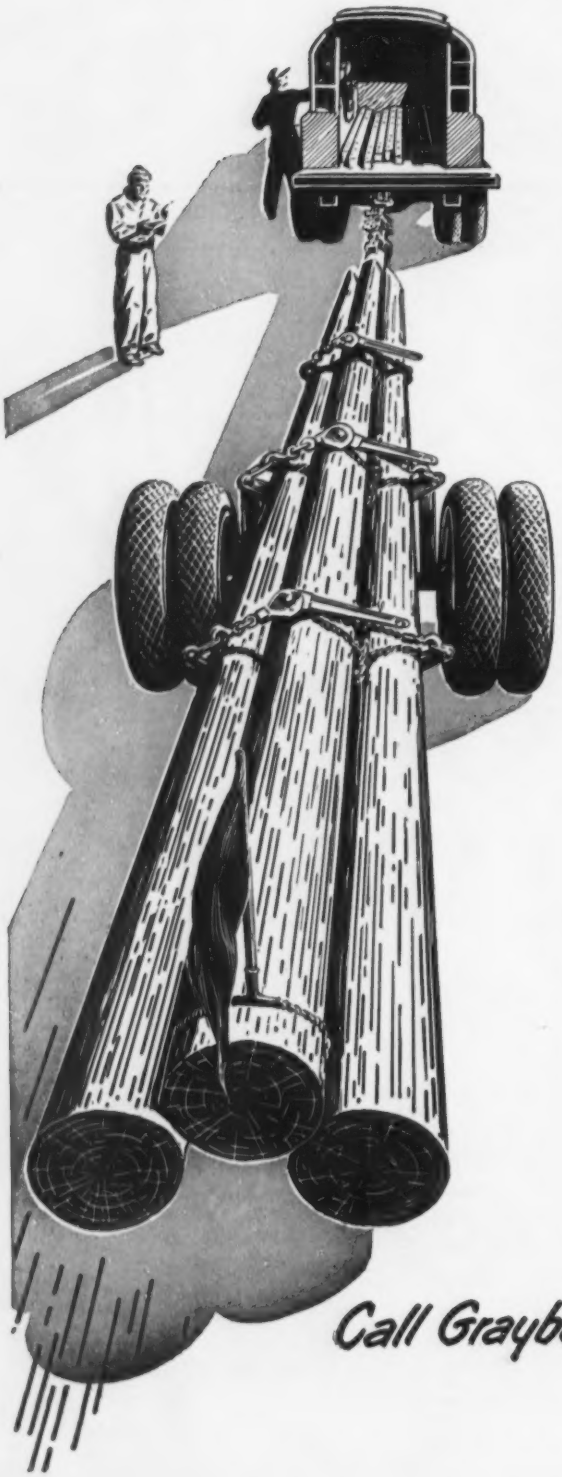
UP TO 100 AMPERES

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JM54-7

POLES and CROSSARMS

– via GraybaR



There's a type of pole and crossarm for every power-line requirement. And an order placed with Graybar means that you can get the kind you need *when* and *where* you need it.

Because differing conditions influence local preferences, Graybar distributes *all* types of poles – full-length, pressure-treated Fir and Cedar... butt-treated Northern and Western Cedar. They're all carefully selected and processed to provide maximum strength and durability.

Graybar-distributed crossarms are seasoned under rigid methods – are strong, long-lasting and provide a wide margin of safety in the line.

For help in solving usual, and *unusual*, pole-line problems, call on Graybar Outside Construction Specialists – they're located in key areas throughout the nation. And for convenience, speed and direct action, route all your line material orders via Graybar. *Graybar Electric Co., Inc. Executive Offices: Graybar Building, 420 Lexington Avenue, New York 17, N. Y.*

309-98

Call Graybar for
POLES AND CROSSARMS

International creosoted Southern Pine poles
National pressure-treated Douglas Fir poles
National full-length pressure-treated Super Cedar poles
National butt-treated Cedar poles
Rainier Fir crossarms

Call Graybar first for...

GraybaR *Everything Electrical*

IN OVER 110 PRINCIPAL CITIES

Electric Cooking Meets the Chef's Needs

"Our new electric cooking installation not only gives our chef and cooks the type of equipment they want and need, but also it simplifies the task of cleaning and maintaining the kitchen." Thus Jerry Smith, building superintendent of the Hotel Utah, Salt Lake City, describes their new 156-kw commercial cooking installation. It includes custom-built frames for the ranges, a wiring trough that avoids fusing of control equipment, and a lighting system that provides more than 40 ft-c on the cooking equipment.

From the chef's standpoint: "At a recent banquet we served tenderloin steaks right off the grill to 1,475 people. We grill fish on our range tops too—a specialty of the house," said Hotel Utah's chef Gerard. "Aside from better cooking efficiency, there was a 20% reduction in kitchen heat when we switched from gas," he reports.

About 1,000 lb of meat is roasted on an average day in the kitchen. The hotel management feels it can save enough through reduced meat shrinkage to pay for the new ovens in a few years. In 1953, the hotel bought 458,000 lb of beef, pork, lamb, fish and poultry and savings through less shrinkage could amount to a sizeable figure. Regarding operating costs, the $11,000 of new equipment uses about 575 kwhr during an eating period. This comes to an estimated 7.5 mills per individual meal.

The main kitchen contains three rows of cooking equipment. In the first are the hot tables. Next comes a row of five sections of electric range tops, with a 15.9-kw rating per section, plus two 18-kw fry kettles. The last row includes steam-jacketed cooking kettles. Flanking these are a pair of two-section, stainless steel, two-pan electric ovens rated at 10 kw each.

Controls on the range grills permit each unit to heat up to 875 F. But even when row upon row of steaks are sizzling away, the kitchen is kept cool and comfortable. Smoke and hot air are exhausted through a vented hood above the ranges, with cool air being supplied through adjacent vents.

To improve working conditions in the kitchen, the hotel had frames custom-built for the new equipment that incorporate the wishes of the chef. Range frames feature a slanted shelf between the legs to facilitate cleaning with a steam hose.

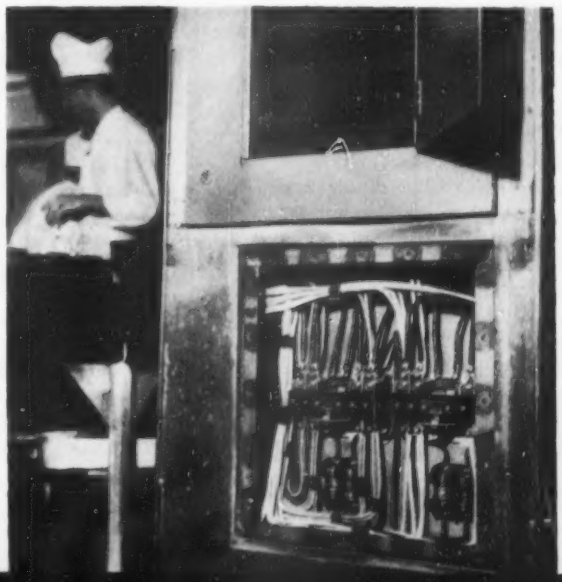
Fusing of control equipment is eliminated through the use of an asbestos-lined, stainless-steel wiring trough. It extends along the back of the five range-tops, where the temperature is much lower, right to the panel board. A separate circuit for each range-top is used. Circuit breakers are remotely located on a nearby pillar. Spare positions in the panel board provide for future addition of six electrical units. Their wiring would be carried in the present trough.

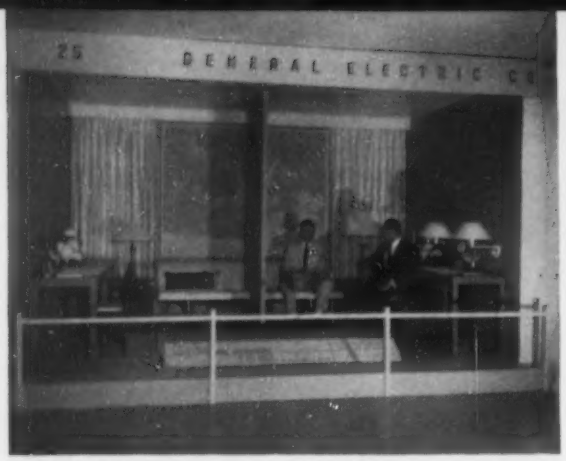
A continuous row of incandescent lamps in vapor-proof fixtures, above each row of cooking equipment, provides more than 40 ft-c of illumination.

DELIGHT OF THE CHEF is the new electric cooking equipment at the Hotel Utah, Salt Lake City. The kitchen has 156 kw of connected load

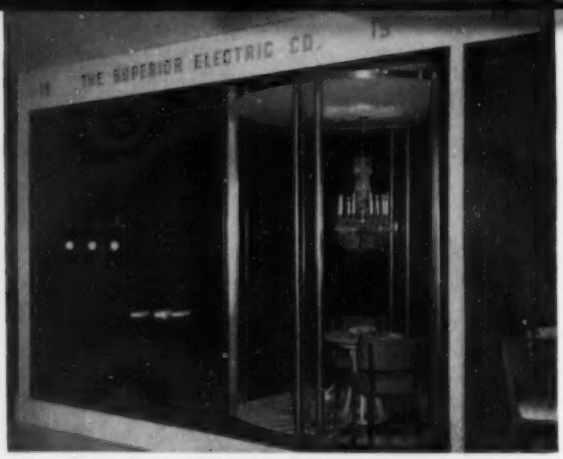
WIRING TROUGH on the back of the ranges is asbestos-lined stainless steel. The cooler location avoids the fusing of control equipment

REMOTELY LOCATED panel board and circuit breakers are removed from heat of equipment. Panel board has provisions for six more circuits





TWO ROOMS were designed for GE by C. E. Stephenson of American Institute of Decorators. Good lighting is shown in room at right while improper methods of lighting are shown in room at left



MOOD LIGHTING was featured in exhibit by The Superior Electric Co with rheostatic controls, operated by three switches at left, giving any desired lighting level. Intensities are changed smoothly

Decorators' Show Features Lighting

Lighting was one of the features of the American Institute of Decorators' show in Chicago, June 24 to July 1. Exhibits by manufacturers on lighting applications and a display of table lamps drew the attention of many show visitors. General Electric Lamp Division's booth (picture at left) showed right and wrong ways of doing a lighting job in the home. The Superior Electric Co displayed a lighting installation (right) with rheostatic control for "mood" lighting. An added attraction was lighting in the exhibit sponsored by the Wisconsin Chapter of AID. It was designed especially for the Decorators' show by the Chicago Lighting Institute.

Range Contest Draws 35,634 Entries

Pennsylvania Power & Light Company's April retailer-cooperative sales builder promotion . . . the "Win an Electric Range" Contest . . . enticed 35,634 persons to visit retailer stores to try their luck in winning the 18 free electric ranges. Important to cooperating retailers was the fact that the contest provided them with opportunities to "button-hole" contest entrants, tell their sales stories, make plus sales, and develop a substantial list of names and addresses for follow-up sales efforts. If the "law of averages" of one sale out of every ten calls holds, these 35,634 persons represent a potential total of some 3,500 electric range sales.

In many cases, the contest did exactly what it was intended to do. One Williamsport retailer reported that of six electric range and seven refrigerator sales made during April, three range and one refrigerator sales could definitely be attributed to the contest. In Wilkes-Barre, an alert appliance salesman sold one contest entrant an even thousand dollars of electric appliances. And still another Wilkes-Barre retailer was so well pleased with his results that he is now engaged in a follow-up promotion.

The contest wasn't equally effective in all areas. An average of 80 persons visited each retailer's store in the Wilkes-Barre-Hazelton-Honesdale area to sign up for the contest . . . the system average was 42. One reason for the homemaker interest shown there may well have been the tremendous retailer tie-in newspaper advertising that was scheduled during the event.

Predicts Air-Cooled Equipment

"Within five years 80% of all home air conditioning installations will use air-cooled equipment or water saving devices," predicts S. J. Levine, general manager of the General Electric Company's Home and Cooling Department.

Announcing the results of a nationwide survey undertaken by GE, in ten years 95 to 100% of all air conditioning equipment installed will be of the waterless air-cooled or water saving type.

Mr. Levine said the trend to air-cooled equipment will stem from an increasingly critical water situation in most parts of the country. This situation will become more and more acute as the nation continues to grow and demands for home air conditioning increase.

In addition to water supply problems, Levine stressed the problem of disposal. He noted that increased use of water puts a greater strain on sewage facilities with resulting higher expense.

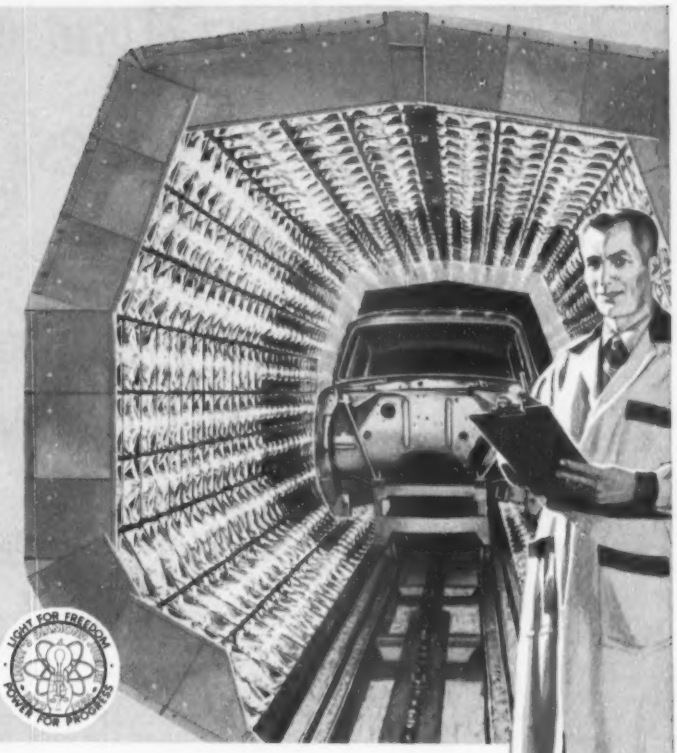
The saving in water cost realized by using air-cooled units can offset the higher electric power expense of this equipment, according to Mr. Levine. In any given area, he pointed out, the economics of air-cooled versus water-cooled equipment depend on relative rates for electricity and water. The selection of water-cooled or air-cooled units also depends on local regulations affecting water supply and disposal.

Correction

In the story on Con Edison's adequate wiring movie which appeared in Electrical World, Aug. 9, 1954, p 163, the first sentence in the second column reads: "Last year 940,000 room coolers were sold in the territory." This should have read 94,000 room coolers.

KNOCK HOURS OFF BAKING OPERATION TIME!

Save your customers big money... improve efficiency with ...



SYLVANIA'S IMPROVED

INFRARED LAMPS!

MORE and more cost-conscious production engineers are today turning to Sylvania's complete line of Infrared Lamps for their baking and drying operations.

Faster heat . . . more efficient operation!

Sylvania lamps start heating immediately . . . at a flick of the switch. Their radiant energy provides intense heat the instant it contacts the work. Helps reduce warm-up period . . . shortens time lag.

In addition to this time saving, Sylvania's compact Infrared Lamps in suitable equipment can save many hundreds of dollars in floor space. New illustrated folder tells the complete story about Sylvania's great line of Infrared Lamps. For your copy write to Dept. 4L-2821, Sylvania today!

650/1550R47
Sylvania's new exclusive 1550-watt gold reflector Infrared Lamp with special 3 terminal base.

375G30
Clear glass Infrared Lamp, 375 watts.

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LIGHTING • RADIO • ELECTRONICS • TELEVISION

Insulator Prices

vs.

Insulator Performance

So-called "bargain" insulators are supposed to cut costs.

That they do, but *first* costs only . . . and by only a few cents per insulator.

Price is hardly a measure of the long range performance which is naturally your first concern when considering insulators. For, as you know, price tag savings can be wiped out many times by failure of a single insulator on any of your transmission or distribution lines. Premium performance rarely comes at a bargain price.

Be safe! Invest in the traditional dependability of Locke Insulators.

LOCKE

LOCKE DEPARTMENT
GENERAL ELECTRIC COMPANY
BALTIMORE, MARYLAND

Texas Companies Start 'Em Right . . .

. . . before putting an apprentice on the pole

GEORGE A. SEAMAN, Sr., Chairman of the Host Committee, Fifth Annual Southern States Apprenticeship Conference, Fort Worth

Two Texas electric companies are profiting from well-developed apprenticeship programs. At the Fifth Annual Southern States Apprenticeship Conference held at Fort Worth, officials of these companies were able to make substantial contributions to the meeting based on years of experience with formalized apprenticeship plans. They were also able to compare notes on training, especially apprenticeship.

The two companies are the Texas Power & Light Co, Dallas, and the Southwestern Public Service Co, Amarillo. Here are some of the highlights of their apprenticeship programs.

Texas Power & Light Co . . . Historically, this company's training program for lineman began to evolve with the appointment of a safety director. It was soon apparent that safety and training are closely interwoven. The teaching of safety involved demonstration of work methods. The next step was why—fundamentals of electricity, transformer connections, and the like, which led to the establishment of related classes.

By the time veterans returning from World War II began to swell the ranks of apprentices, the training program was well defined. It was put in writing and registered with the Bureau of Apprenticeship, U. S. Department of Labor, whose representative offered useful suggestions. Presently some 30 Korean veterans are drawing PL 550 subsistence allowances which augment their regular pay.

Apprentices are hired by crew foremen. The foreman keeps his eye open for good prospects, bearing in mind the necessary qualifications. The normal ratio of apprentices to journeymen is one to three, but expanding operations, piled on top of the war-time lapse in training of apprentices, made feasible an excess of the ratio in numerous instances.

The term of apprenticeship is the conventional four years. If the apprentice does not progress satisfactorily, he may be given a repeat period of six months. Failing that, he is washed out. Payroll classification of apprentices uses the parallel designation of: 1. Groundman; 2. Lineman C; 3. Lineman B; and 4. Lineman A, each with two steps of six months each. There are three types of lineman—transmission, distribution, and construction. Other trades covered are transmission electrician, construction electrician, meter tester and repairer, and repairer and winder.

Each apprentice is given a booklet entitled, "Advancement Questions." These questions, arranged by classification, constitute the actual examination at the end of the period. They are not yes and no or multiple choice questions; they are comprehensive and compressed. Most begin with "explain" "show" "demonstrate" or "draw." To get the answers in the six months period, the apprentice must seek information on the job and make liberal use of references. References are indicated along with the questions. Every crew is furnished with all reference material needed by its apprentices. Many of whom supplement these with purchases of their own.

A one-hour session on safety practices is conducted once a week for the entire crew. Classroom instruction is given at night at central locations during certain seasons of the year.

Upon completing his training, the apprentice, now a journeyman, makes application to the company for a "Certificate of Achievement." Approval is required by the foreman, superintendent, and district manager. The certificate itself was designed by the company and is handsomely lettered on parchment paper, with the company seal attached.

Responsibility for the direction of the apprenticeship program is lodged with the safety and training engineer. He works in close collaboration with other departments, especially personnel, operating, and engineering. Once every few months, all foremen of a division or subdivision are called together for a session which begins in the afternoon. New materials and

ONE HOUR SAFETY SESSIONS, ONCE A WEEK SHOW THE APPRENTICE

methods are demonstrated, old problems reviewed for possible solution, company planning and programming indicated. Much of the information, in particular that which applies to the job, will be passed on by the foreman to his crew, including apprentices. The emphasis is not, "Do you understand it?" but "Can you explain it well to others?" When a foreman is heard to say, "Now if I just had that chart, I wouldn't have any trouble getting it across," no time is lost in providing the chart, kit, or whatever is needed.

An overall evaluation of the program indicates that it is generally satisfactory and was instrumental in establishing a record for safety which won a national first in 1953.

Southwestern Public Service Co . . . Growing pains of this west Texas company, whose lines extend into Oklahoma and New Mexico, have emphasized the need for sound training of linemen and associated trades. After a trial run in two divisions, its apprenticeship system has been established in remaining three divisions.

The company has bargaining relationships with Local Union 602, International Brotherhood of Electrical Workers—AFL. With the assistance of a representative of the Bureau of Apprenticeship, apprenticeship standards were developed jointly. These standards outline in detail the method of administering the training program. They became operative at the division level when accepted by company and union representatives in the respective divisions.

Division joint apprenticeship committees, composed of two appointive members each from labor and management, play a key role in the supervision of training. The Division "JAC" reviews progress of apprentices and prepares suitable examinations for the periodic advancements. It acts in a liaison capacity and has advisory functions in matters which affect the apprentice.

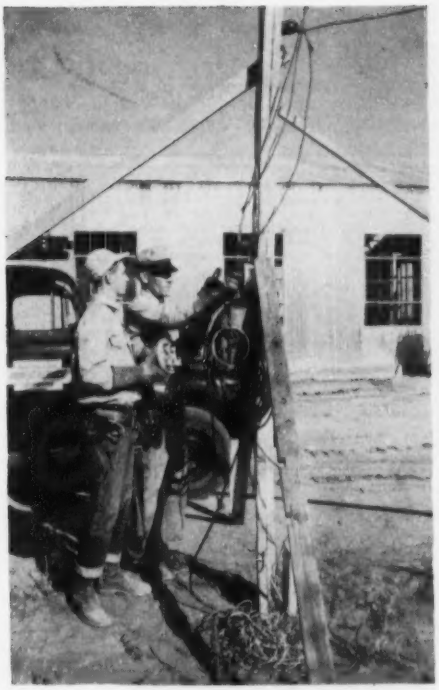
Although the number of apprentices assigned to a particular crew will vary, the specified ratio of one apprentice to three journeymen is adhered to on a company-wide basis. Hiring of apprentices is done by line superintendents, after approvals required by company procedure.

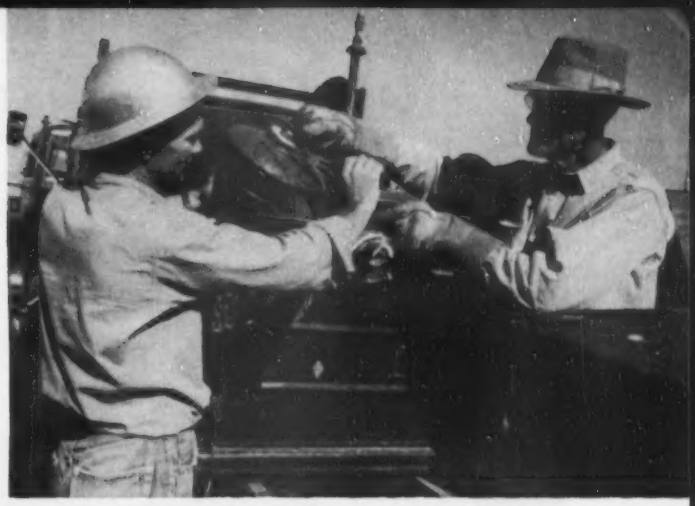
For the first year, the apprentice (or perhaps more accurately, prospective apprentice) is classified as a groundman. During this period he does no climbing. The year is split into two periods, B and A, with a wage increase at the end of the first six months.

This year gives ample opportunity to size up the young man; and if he makes the grade, he is recognized as a full fledged apprentice. At this time chairman of Joint Apprenticeship Committee confers with the foreman to whom apprentice is assigned.

The foreman is briefed on any pertinent facts and reminded of his responsibility to see that the apprentice is given assignments of gradually increasing difficulty in keeping with his growing ability. During his term, the apprentice will be rotated so as to serve under more than one foreman.

In cooperation with local school officials, evening





Apprentice practices making a hot-line tie on a new insulator

Apprentice learns how to splice an aluminum conductor

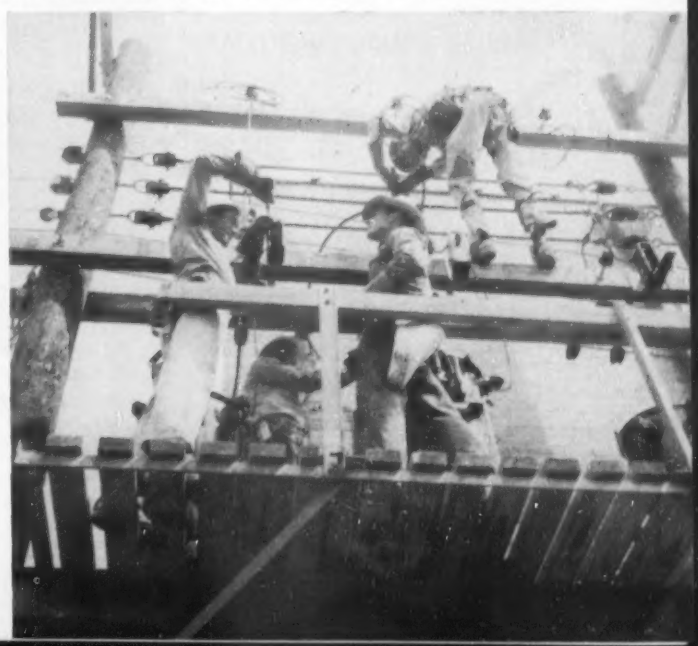
WHAT TO DO ON THE POLE

classes of related instruction have been set up. Classes are held for four hours a week on company property; the instructors are paid by the public schools under the arrangement authorized by the Smith-Hughes and later acts. The school authorities further assist by coaching instructors in the art of teaching. Often a top-notch journeyman is seriously deficient as an instructor without such help. Company engineers handle subjects such as electrical theory, transformer and capacitor connections, etc; journeymen linemen teach rope and cable splicing, pole top installations, and the like.

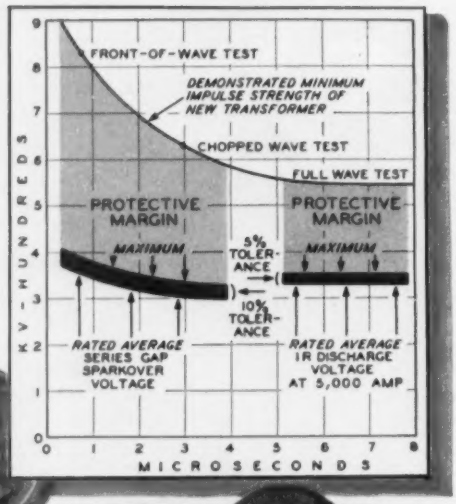
At the conclusion of the four year term, representatives of the committee put the apprentice through a comprehensive examination, both oral and written, which may take as long as a day. If the apprentice fails, he can be given a repeat period. If he passes, he is promoted to journeyman and is awarded a "Certificate of Completion" by the committee. In Texas and Oklahoma an apprentice who finishes receives a certificate furnished by the U. S. Department of Labor. New Mexico completions are recipients of a handsome certificate obtained from the New Mexico State Apprenticeship Council.

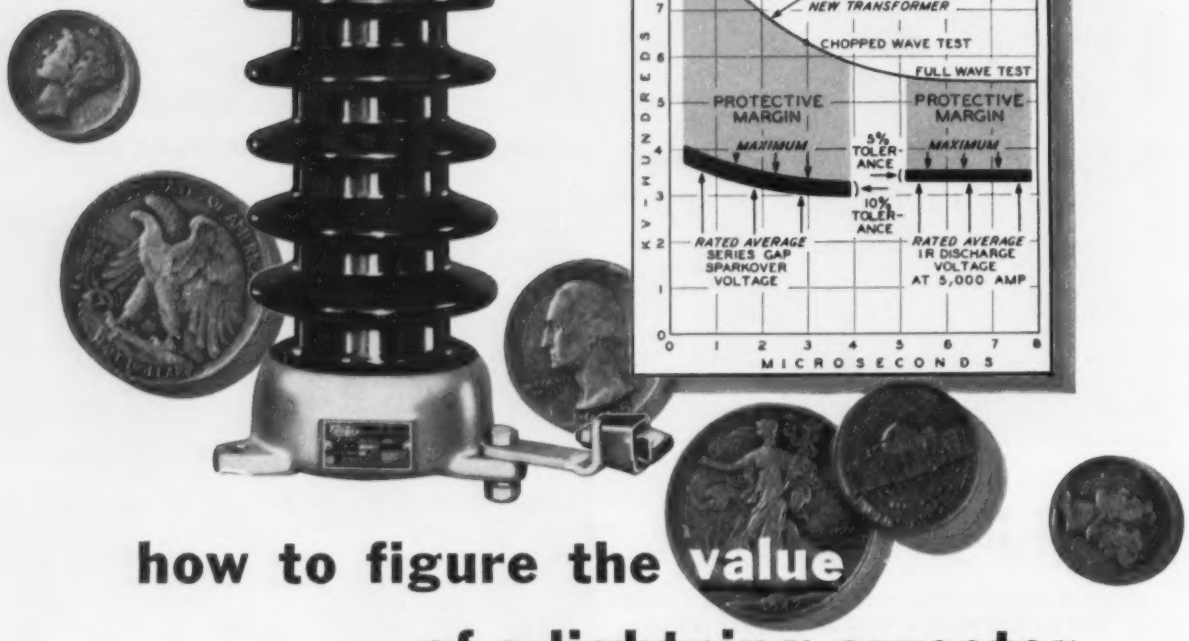
Southwestern PS feels that its apprenticeship program is beneficial to employee morale. Like its neighboring utility, the company is in the market for new ideas in training. Its representatives and selected JAC members expect to compare notes with others similarly engaged at the Sixth Annual Southern States Apprenticeship Conference to be held in Atlanta on Sept. 9 to 11.

Apprentice hooks up high side lead from a 25 kva transformer



Typical protective performance of a Thorex lightning arrester, illustrating Rated Averages, Tolerance, Maximums, and "Protective Margin."





how to figure the value of a lightning arrester

Is there any positive way to measure your money's worth in the purchase of a lightning arrester? Actually, you can arrive at such a figure, accurate to the second decimal place!

Take rated average catalog IR discharge values. To these add the manufacturer's tolerance. The sum of the two is MAXIMUM protective level -- the only realistic point from which arrester performance can be measured. *Every* Thorex arrester meets or improves on this value. You already know the minimum impulse insulation strength of your equipment. Between the two is a zone called "Protective Margin". It is expressed in kv. Cost of your arrester is expressed in dollars. See what you *pay per kv* of Protective Margin and you will end up buying the O-B Thorex -- giving you not only the greatest protection per dollar, but the greatest protection regardless of cost!

Ohio Brass

MANSFIELD OHIO, U.S.A.

4422-M

MANUFACTURERS AND MARKETS

Brazil Supplies . . .

. . . Own motor needs. Production for 1954 is expected to reach 600,000. Other electrical products up

SAO PAULO (McGraw-Hill World News)—In the past eight years Brazil's electric motor industry has grown from almost nothing to where it's supplying nearly all the country's requirements for most types of motors, according to Conjuntura Economica, organ of the Brazilian Institute of Economics.

Before World War II, Brazil imported 60,000 motors annually, but by 1949 national production amounted to 80,000 units. Production in 1952 was, according to Sindicato da Industria de Aparelhos Eletricos e Similares de Sao Paulo, 98,400 3-phase motors from ¼ to 85 hp, 60,000 single-phase motors, and 178,000 universal motors —a total of 336,400 motors.

Since 1952 the industry's growth has continued, and production of motors in 1954 is estimated at 600,000.

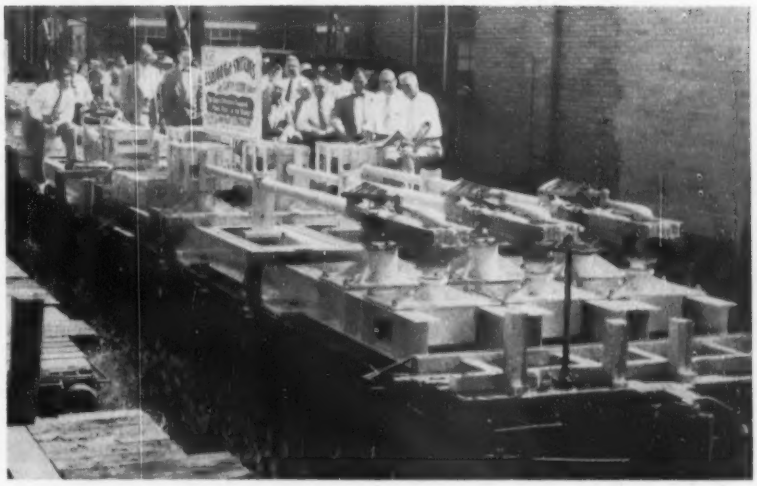
Production of other electric equipment also grew. Meter production increased to 115,000 in 1953. Transformer production measured in potential kilowatt output increased by 2,650% from 1930 to 1950. Fluorescent lamp output grew by 2,200% between 1942 and 1950, while incandescent lamp production increased by 1,100% from 1921 to 1950.

Coal Production

During 1953 442 companies produced 390,920,603 tons of bituminous and lignite coal. Pittsburgh Consolidation accounted for 27,209,616 tons. There were 79 producers of one-million tons or over, 20 of them captive companies. In 1947, coal's peak production year, 107 companies topped the million-ton mark.

Utility owned operations reached a new all-time record, 10,207,000 tons.

Anthracite figures show that 39 companies produced 26,122,398 tons. These figures are from the Keystone Coal Buyers Manual, a McGraw-Hill publication.



R&IE Ships 330-Kv Switches

The first two of 18 carloads of 330-kv switches have been shipped for Clifty Creek Station—the world's largest privately financed generating plant. Shipment was made by R&IE Equipment Division of I-T-E Circuit Breaker Co. It will furnish 105 single-pole switches for the 1,200-Mw plant, which will be operated by Indiana-Kentucky Electric Corp, a subsidiary of Ohio Valley Electric Corp, a power pool of 15 utilities.

Carboloy Opens New Lab for Magnetism Studies

A very modern laboratory having every conceivable type of equipment for measuring magnetic fields and analyzing magnetic materials was recently opened by Carboloy Department of General Electric Co in Detroit. The facilities permit checking designs, measuring performance of equipment, establishing standards, calibrating precision magnetic assemblies, and evaluating new materials.

Among the laboratory's equipment is a recording hysteresigraph, illustrated, that automatically makes a complete and accurate record of a magnet's hysteresis loop. Any or all parts of the major or minor loops can be explored by the operator.

Another important instrument is a 3,000-v capacitor discharge impulse magnetizer for magnetizing odd-shaped single large magnets or magnetic assemblies.

MANUFACTURING BRIEFS

R T & E Co, has announced that the new 18,000-sq ft addition to its Waukesha, Wis., plant will be completed and all its operations will be moved in by about Sept. 1. The plant will then have 5,000 sq ft of office and experimental space and 25,000 sq ft of manufacturing and production area, for making transformers, regulators, and protective equipment.

Fidelity Machine Co, Inc, Philadelphia, Pa, has been appointed American distributor for insulator-taping machines by a European manufac-

turer, Pourtier Pere et Filo of France. The machine covers fine wire with a tape form of insulation and in case of breakage, stops automatically.

Phillips Control Corp, a subsidiary of Thor Corp, has leased a new building in the West Los Angeles area to manufacture actuator relays and electrical control components.

MEETINGS CALENDAR

Southeastern Electric Exchange
Personnel Administration Section, Grove Park Inn, Asheville, N. C., Aug. 19-20; Engineering and Operation Section, Thomas Jefferson Hotel, Birmingham, Ala., Sept. 23-24; Accounting Section, Roanoke Hotel, Roanoke, Va., Oct. 21-22; General Sales Conference, Roosevelt Hotel, New Orleans, La., Oct. 28-30; Accident Prevention Committee, Heidelberg Hotel, Baton Rouge, La., Nov. 11-12; Annual Meeting, Boca Raton Hotel and Club, Boca Raton, Fla., Mar. 21-23, 1955; Engineering and Operation Section, Roosevelt Hotel, New Orleans, La., April 7-8, 1955.

International Electrotechnical Commission
50th Anniversary Meeting, University of Pennsylvania, Philadelphia, Sept. 1-16.

American Society of Mechanical Engineers
Fall Meeting, Schroeder Hotel, Milwaukee, Sept. 8-10; Annual Meeting, Statler Hotel, New York, Nov. 28-Dec. 3.

Rocky Mountain Electrical League
Annual Fall Convention, Stanley Hotel, Estes Park, Colo., Sept. 12-15.

Illuminating Engineering Society
National Technical Conference, Chalfonte-Haddon Hall, Atlantic City, N. J., Sept. 13-17.

Pennsylvania Electric Association
47th Annual Meeting and Business Conference, William Penn Hotel, Pittsburgh, Sept. 14-15; Fall Meeting, Systems Operation Committee, Alexander Hotel, Hagerstown, Md., Oct. 7-8; Fall Meeting, Relay Committee, Hotel Alexander, Hagerstown, Md., Oct. 14-15; Fall Meeting, Electrical Equipment Committee, Hotel Robert Treat, Newark, N. J., Oct. 19-20.

Public Utilities Association of Virginias
36th Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., Sept. 16-18.

Edison Electric Institute
Accident Prevention Committee, Benjamin Franklin Hotel, Philadelphia, Sept. 20-21; Industrial Relations Committee, Round Table Conference, Palmer House, Chicago, Sept. 27-29; Meter and Service Committee, Leland Hotel, Springfield, Ill., Sept. 27-29; EEI-AGA Tax Committee, Brown Palace Hotel, Denver, Colo., Sept. 29-Oct. 1; Prime Movers Committee, De Witt Clinton Hotel, Albany, N. Y., Oct. 4-5; Area Development Workshop, Hotel Statler, Cleveland, Ohio, Oct. 7-8; Transmission and Distribution Committee, Sir Francis Drake Hotel, San Francisco, Calif., Oct. 7-8; Electrical Equipment Committee, Hotel Statler, Hartford, Conn., Oct. 11-12; Industrial Relations Committee, in conjunction with North Central Electrical Association, Minneapolis, Minn., Nov. 18-19; Prime Movers Committee, Astor Hotel, New York, Nov. 29-30.

Missouri Valley Electric Association
Accounting Conference, Jefferson Hotel, St. Louis, Mo., Sept. 23-24; Sales and Rural Conference, President Hotel, Kansas City, Mo., Oct. 6-8; Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 3-4, 1955; Engineering Conference, President Hotel, Kansas City, Mo., March 23-25, 1955.

American Institute of Electrical Engineers
Committee on Petroleum, Conference on Electrical Applications in Petroleum Industry, Mayo Hotel, Tulsa, Okla., Sept. 27-29; Middle Eastern District Meeting, Abraham Lincoln Hotel, Reading, Pa., Oct. 5-7; Fall General Meeting, Morrison Hotel, Chicago, Oct. 11-15; Winter General Meeting, Hotel Statler, New York, Jan. 31-Feb. 4, 1955.

Institute of Radio Engineers
Professional Group on Industrial Electronics and Pittsburgh Section of IRE, Symposium, Mellon Institute, Pittsburgh, Pa., Sept. 29-30.

International Association of Electrical Leagues
19th Annual Conference, Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 29-Oct. 2.

National Electronics Conference
10th Annual Conference, Hotel Sherman, Chicago, Oct. 4-6.

National Association of Electrical Distributors
Pacific Zone Convention, Mark Hopkins Hotel, San Francisco, Oct. 4-7.

Indiana Electrical Association
Annual Convention, French Lick Springs Hotel, French Lick, Ind., Oct. 6-8.

Interstate Power Club
Meetings will be held at Hotel Martinique, New York, on following dates: Oct. 11, Dec. 6.

Controllers Institute of America
Annual Meeting, Edgewater Beach Hotel, Chicago, Ill., Oct. 10-13.

***National Safety Congress-Exposition**
Conrad Hilton Hotel, Chicago, Oct. 18-22.

Oklahoma Utilities Association
Electric Light and Power Division, Western District Meeting, Duncan, Okla., Oct. 21; Eastern District Meeting, Ada, Okla., Oct. 22; Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25, 1955.

Public Information Program
Workshop Conference, Chase Park Plaza Hotel, St. Louis, Oct. 28-29.

National Electrical Manufacturers Association
Annual Meeting, Haddon Hall Hotel, Atlantic City, N. J., Nov. 8-11; Winter Meeting, March 7-11, 1955.

National Association of Railroad and Utilities Commissioners
Annual Convention, La Salle Hotel, Chicago, Ill., Nov. 8-12.

American Standards Association
36th Annual Meeting and 5th National Conference on Standards, Hotel Roosevelt, New York, Nov. 15-17.

21st National Power Show
Sponsored by American Society of Mechanical Engineers, Commercial Museum, Philadelphia, Dec. 2-7.

Eastern Joint Computer Conference-Exhibition
Bellevue-Stratford Hotel, Philadelphia, Dec. 8-10.

National Association of Purchasing Agents
24th Annual Mid-Winter Conference, Public Utility Buyers' Group, Shamrock Hotel, Houston, Tex., Feb. 13-15, 1955.

Southern Safety Conference-Exposition
Jung Hotel, New Orleans, La., Feb. 27-Mar. 1, 1955.

*Additions this week.

MANUFACTURERS' EARNINGS

Company	Period Months Ended		Net Income 1954	Net Income 1953	Earnings Per Common Share 1954	Earnings Per Common Share 1953
Aluminum Co of America	6	June 30	$19,235,642	$27,133,771	1.80(a)	2.64(a)
American Gas & Electric Co.	12	June 30	30,332,961	30,227,532	2.36	2.54
Babcock & Wilcox Co.	6	June 30	7,096,522	6,438,331	4.56(a)	4.35(a)
Baltimore & Ohio RR.	6	June 30	7,246,803	13,649,997	...	...
Bethlehem Steel Corp.	3	June 30	30,755,412	28,534,103	3.04	2.81
Bethlehem Steel Corp.	6	June 30	58,558,350	59,495,136	5.77	5.87
Blaw-Knox Co.	3	June 30	1,017,297	943,854	0.67(a)	0.67(a)
Blaw-Knox Co.	6	June 30	2,159,334	1,971,887	1.42(a)	1.40(a)
Copperweld Steel Co.	6	June 30	536,662(p)	1,837,625	0.80	3.33
Cutler-Hammer Inc.	6	June 30	2,133,288	1,898,993	3.23	2.88
Dow Chemical Co.	12	May 31	33,425,004(q)	35,856,926	1.42	1.58
Fairbanks, Morse & Co.	6	June 30	1,029,979	1,861,604	0.85(b)	1.54(b)
Foster Wheeler Corp.	6	June 30	2,433,455	1,002,596	4.24	1.76
General Cable Co.	6	June 30	2,434,657	2,971,347	1.09	1.36
General Electric Co.	3	June 30	45,827,000	41,568,000	0.53(a)	0.48(a)
General Electric Co.	6	June 30	93,856,000	75,417,000	1.08	0.87(a)
Gulf Oil Corp.	6(e)	June 30	77,942,000	75,760,731	3.18	3.09(b)
Hubbell, Inc, Harvey	6	June 30	501,500	519,150	1.56	1.62
Inland Steel Co.	3	June 30	9,954,419	8,872,321	2.00	1.81
Inland Steel Co.	6	June 30	19,417,669	15,677,521	3.92	3.20
Internat. Business Mach.	6	June 30	21,600,314	15,575,997	5.27	3.80(b)
Kidde & Co, Inc, Walter	6	June 30	595,000	521,000	2.77	2.49
Koppers Co, Inc.	6	June 30	3,295,994	4,572,341	1.55(a)	2.29(a)
Mallory & Co, P. R.	3	June 30	77,614(f)	...	...	...
Mallory & Co, P. R.	6	June 30	313,383	1,713,496	0.24	2.59
McGraw Electric Co.	6	June 30	5,082,000	3,651,000	4.95(a)	3.60(a)
Minn. Mining & Mfg Co.	3	June 30	6,289,437	4,701,252	0.75	0.57
Minn. Mining & Mfg Co.	6	June 30	11,644,303	9,056,111	1.39	1.09
National Vulcanized Fibre	3	June 30	109,677	258,184	0.19	0.48
National Vulcanized Fibre	6	June 30	159,305	466,684	0.27	0.87
Owens-Corning Fibreglass	6	June 30	3,639,053	3,110,178	1.16	0.99
Pittsburgh Coke & Chem.	3	June 30	344,000	1,020,000	0.26	1.01
Pittsburgh Coke & Chem.	6	June 30	376,000	1,803,000	0.17	1.76
Radio Corp of America	3	June 30	9,202,000	8,892,087	0.60	0.57
Radio Corp of America	6	June 30	19,268,000	18,185,228	1.26	1.18
Socony-Vacuum Oil	6(e)	June 30	88,000,000	88,000,000	2.51	2.51
Sun Chemical Co.	6	June 30	617,075	543,765	0.48	0.42
U. S. Steel Corp.	3	June 30	49,020,738	55,640,806	1.63	1.89
U. S. Steel Corp.	6	June 30	93,851,114	105,016,764	3.11	3.54
Westinghouse Electric Corp.	3	June 30	19,073,000	18,802,000	1.15(a)	1.15(a)
Westinghouse Elec Corp.	6	June 30	45,359,000	35,660,000	2.75(a)	2.19(a)
White Motor Co.	6	June 30	2,343,706(r)	1,965,143	2.58(a)	2.52(a)

Note—(a) On shares outstanding at close of respective periods. (b) Based on shares now outstanding. (e) Estimated. (f) Net loss. (p) Includes $172,887 of non-recurring income from restoration of excess provision for renegotiation of prior years. (q) Includes $3,700,000 tax credit. (r) Includes $1,128,000 tax refund. (s) On the basis of the new shares after the three for one conversion approved by share owners April 20, 1954.

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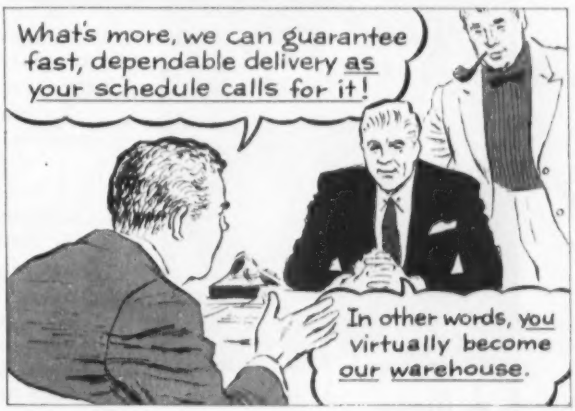
What's more, we can guarantee fast, dependable delivery as your schedule calls for it!
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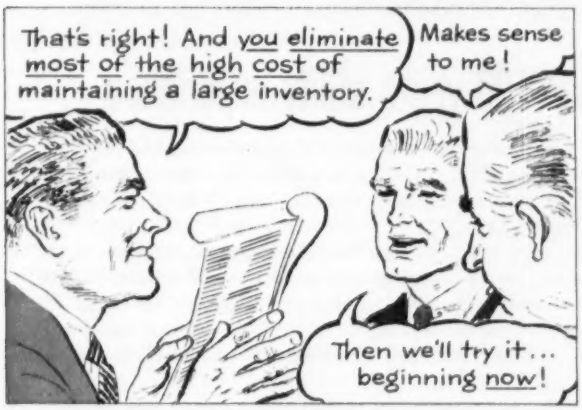
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Interstate Electric Co. of Shreveport, Inc.
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J. S. Gracy

4 Labor Topics to Be Discussed at EEI's Round Table Conference

"People" is the theme that will run through the four principal topics to be discussed at the Eighth Round Table Conference of Edison Electric Institute Industrial Relations Committee. This conference will be held at the Palmer House, Chicago, Ill., Sept. 27-29.

The four prominent utility industrial relations executives and their topics are:

1. "Motivation of Employees' Behavior," J. P. Flemming, general supervisor of personnel services, The Cleveland Electric Illuminating Co, Cleveland, Ohio.
2. "Employee Relations in the Retirement Area," T. G. Ayers, vice president, Commonwealth Edison Co, Chicago, Ill.
3. "Collective Bargaining Techniques—Manpower Management," E. J. Brill, director of employee relations, Pennsylvania Power & Light Co, Allentown, Pa.
4. "Role of Industrial Relations in the Area of Management," J. S. Gracy, vice president, Florida Power Corp, St. Petersburg, Fla.

After the groundwork has been laid by these speakers at the Monday morning session, conferees will divide into groups of eight to continue the discussion of these four topics. These round table conferences will be held Monday and Tuesday afternoons and on Tuesday and Wednesday mornings.

More than 100 years utility experience . . .

Flemming who will speak on employees' behavior has had 30 years' experience in the electric utility field, embracing construction, purchasing, office management, and personnel. He has been with Cleveland Electric since 1949.

Ayers, whose topic has to do with the retirement of employees, began his electric utility career with Public Service Co of Northern Illinois (now Public Service Division of Commonwealth Edison) in 1938. He became manager of industrial relations in 1948, an assistant vice president in 1952, and vice president in charge of industrial relations in 1953.

Brill, who will discuss the collective bargaining aspect, tops 36 years of service with PP&L in operating and commercial positions. For the last eight years he has been director of employee relations.

Gracy, who will cover the functions of the personnel department, brings 27 years' experience to the round table conference, including both operating and industrial relations knowledge. As vice president he has had responsibility for division operations, sales, and industrial relations.

D. A. Bartlett, who works for Western Massachusetts Electric Co and is chairman of the subcommittee charged with drawing up the program for the conference, said last week that final arrangements have now been completed for the general meeting speakers and the conference leaders. There is still one luncheon speaker to be named, Bartlett stated.

For further information on the coming round table conference, write Edward S. Evans, secretary, Industrial Relations Committee, Edison Electric Institute, 420 Lexington Ave., New York 17.

New Stock Plan . . .

. . . is filed with PSC by Georgia Power to refinance preferred stock at lower interest rates

Georgia Power Co has asked the Public Service Commission for permission to refinance 433,869 shares of its $6 preferred stock at a lower interest rate.

Herman W. Boozer, vice president in charge of finance for Georgia Power, who presented the petition to the PSC, said that the purpose is to reduce the company's expenses by bringing the dividend rate "in line with rates paid by other utilities for similar types of securities."

Stockholders to be Given Choice . . . The petition said that the owners of the 433,869 of $6 preferred will be given a choice of accepting a share of the new preferred and $5 in cash for each share of $6 stock or accepting the call price of $110 per share.

On the basis of competitive proposals subject to SEC approval, Georgia Power has selected an underwriting group headed by First Boston Corp, to handle the refinancing deal. Offering price of the new stock is expected to be $105 a share. Exchange period will be Sept. 15-Oct. 4.

Boozer said the refinancing will also require approval from the Securities and Exchange Commission. It will also entail an amendment to the company's charter.

The commission has set hearing on the petition for Aug. 31.

FINANCIAL BRIEFS

Shenandoah Valley Electric Cooperative, Dayton, Va., has purchased the electric system of Hardy County Light & Power Association, Moorefield, W. Va. . . . **Missouri Power & Light Co** has sold its water properties in Excelsior Springs, Mo., to the city for $536,027.

Sacramento, Calif., Municipal Utility District has changed over its entire accounting procedure to "modern work-saving, time-saving electronic business machines."

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
Aug 5	**2.86**	**2.92**	**3.15**	**3.98**	**4.09**	**4.42**	**4.38**	**4.70**	**5.04**
July 29	2.87	2.92	3.16	3.98	4.09	4.43	4.43	4.72	5.13
END OF QTR.									
2nd 1954	2.90	2.96	3.19	4.03	4.14	4.48	4.72	5.04	5.45
1st 1954	2.82	2.87	3.14	3.88	4.09	4.42	4.83	5.19	5.42
4th 1953	3.07	3.12	3.34	4.17	4.32	4.62	5.07	5.57	5.51
3rd 1953	3.30	3.33	3.54	4.35	4.52	4.83	5.36	5.57	6.01

Data: Reis & Chandler, Inc.

EARNINGS

Company	Period Months Ended		Net Income 1954	Net Income 1953	Earnings per Common Share 1954	Earnings per Common Share 1953
Arizona Public Service	12	June	$4,312,000	$3,444,000	$1.41(a)	$1.20(a)
Central Illinois Public Service	12	June	6,406,831	5,538,690	1.62(b)	1.53(b)
Commonwealth Edison and subsidiaries	12	June	39,417,083	35,456,820	2.38(c)	2.31(c)
Columbus & Southern Ohio Electric	12	June	5,358,358	5,257,807	2.04(f)	2.25(f)
Consolidated Gas Electric Light & Power Co of Baltimore	12	June	10,302,000	11,141,000	1.69(g)	2.00(g)
El Paso Electric	12	June	1,904,561	1,608,764	2.17(h)	2.02(h)
Northern Indiana Public Service	12	June	9,444,755	8,918,247	2.26(i)	2.41(i)
Public Service Co of Indiana	12	June	12,064,120	10,940,258	2.34(j)	2.24(j)
Southern California Edison	12	June	24,289,704	22,747,870	2.65(k)	2.71(k)
West Penn Electric, consolidated	12	June	14,714,323	14,204,131	3.48	3.36

Notes—(a) Based on shares at end of period; (b) Based on shares outstanding at end of respective periods; (c) Based on 16,420,616 shares in 1954 and 14,225,090 shares in 1953; (f) Based on 2,201,360 shares in 1954 and 2,001,360 shares in 1953; (g) Based on 5,488,336 shares in 1954 and 4,945,266 shares in 1953; (h) Based on 840,387 shares in 1954 and 763,988 shares in 1953; (i) Based on 3,489,046 shares in 1954 and 3,121,554 shares in 1953; (j) Based on 4,251,060 shares in 1954 and 4,253,069 shares in 1953; (k) Based on 7,040,597 shares in 1954 and 6,200,589 shares in 1953.

FINANCIAL

Company and Description	Amount Offering (000)	Offering Price	Yield to Public
WEEK OF AUGUST 5-11			
Bonds			
Pacific Power & Light—1st mtg 3½% due 1984	$30,000	102.824%	3.35%
Preferred Stock			
Southern Colorado Power—30,000 sh 4.72% $50 par	$1,500	$50.00	4.72%
SCHEDULED FOR AUGUST—SEPTEMBER—OCTOBER			
Bonds			**Bid Date**
Consumers Public Power District, Neb.—western system revenue bonds due 1956-80	$2,250	.....	Aug. 12
Manitowoc, Wis.—electric revenues due 1955-74	1,250	.....	Aug. 16
New Jersey Power & Light—1st mtg due 1984	8,700	.....	Aug. 17
Southern California Edison—1st mtg due 1979	30,000	.....	Aug. 18
Niagara Mohawk Power—1st mtg due 1984	25,000	.....	Aug. 24
Arkansas Power & Light—1st mtg due 1984	7,500	.....	Aug. 24
Los Angeles, Calif., Department of Water & Power—electric revenues due 1955-84	19,500	.....	Sept. 8
Montana-Dakota Utilities — 1st mtg due 1975	5,000	.....	Sept. 8
Montana-Dakota Utilities—1st mtg due 1956-75	7,000	.....	Sept. 8
Northern States Power (Minn.)—1st mtg due 1984	20,000	.....	Sept. 28
Indiana & Michigan Electric—1st mtg	16,500	.....	Oct. 5
Wisconsin Power & Light—1st mtg	18,000	.....	Oct. 5
Public Service Co of Colorado—1st mtg due 1984	20,000	.....	.....
Dayton Power & Light—1st mtg due 1984	15,000	.....	.....
Preferred Stock			
Northern States Power—200,000 sh $100 par	$20,000	.....	Aug. 24
Oklahoma Gas & Electric—75,000 sh $100 par	7,500	.....	Sept. 14
Tampa Electric—50,000 sh $100 par	5,000	.....	Sept. 21
Indiana & Michigan Electric—40,000 sh $100 par	4,000	.....	Oct. 5
Atlantic City Electric—72,000 sh $100 par	7,200	.....	..... (c)
Common Stock			
California Electric Power—170,000 sh	.....	.....	Aug. 31
San Diego Gas & Electric—800,000 sh	.....	.....	.....
ISSUES RECENTLY POSTPONED			
Bonds			
Gulf States Utilities—1st mtg due 1984	$24,000	.....	.....
Consolidated Edison Co of N. Y.—1st mtg due 1984	50,000	.....	.....
Preferred Stock			
Missouri Public Service—50,000 sh $100 par	$5,000	.....	.....(a)
California Electric Power—105,000 sh $50 par	5,250	.....	.....(b)
Gulf States Utilities—160,000 sh $100 par	16,000	.....	.....

Notes—(a) Postponed indefinitely; Kidder Peabody & Co, underwriters; (b) Temporarily postponed; Merrill Lynch, Pierce, Fenner & Beane group, underwriters; and (c) Probably be sold privately through Union Securities Corp group.

Oklahoma G&E Receives $2,534,000 Annual Rate Increase for Electricity from the Corporation Commission

In an order dated July 1 the Oklahoma Corporation Commission granted, in its entirety, Oklahoma Gas & Electric Co's petition for a $2,534,000 a year rate increase.

The commission's order pointed out that since the company was organized in 1902 numerous rate reductions were made and that four of them "were made since the year 1940 and . . . have been effective since that time, in spite of increases in costs of living, equipment, and supplies."

The order continued: "The application further states that the company is no longer able through economies and efficient operation to continue to furnish the high quality of service to which its customers are entitled and still maintain its present rate schedules, due largely to the major increased cost in the price of fuel and wages, and all items of materials and equipment which it is required to purchase.

"The application further states that, in order to care for the expanding needs for the areas which it serves, it must, some two years in advance of delivery, place orders for equipment and commence the constructing of generating, transmission, and distribution facilities and that, to meet the money obligation of such a construction program, it must raise from the sale of stocks and bonds to the public, the necessary monies to pay therefore, which monies can only be obtained from private investors satisfied to place their savings in the company's hands.

> **"It alleges that present schedules are unreasonably low to maintain the favorable market for the company's securities which has existed in the past and which must be continued into the future . . ."**

91% of Revenues in Oklahoma

The commission, in noting that the company does business both in Oklahoma and in Arkansas with 91% of the revenues being received from the former state, said, "The character of the territory served is similar. Under this series of facts, it seems entirely appropriate for this commission to judge the earnings and the property value in this case on the basis of the company's entire operations rather than to develop apportionments of revenues, costs, and property value which might be of doubtful accuracy and, in any case, could not, in their use, alter the overall result in any important way. The commission, accordingly, will make its determination on the overall operations of the company, but its orders will relate solely to the business done in the State of Oklahoma."

The commission, in weighing the reasonableness of the proposed increase, considered: "(1) The rate base, (2) allowance for operating expenses, taxes (excluding income taxes) and depreciation, (3) rate of return, (4) income taxes."

In the determination of the property value and rate base, the commission's order stated, "The company presented evidence as to its net investment in utility property. The commission's staff examined the company's records for the purpose of verifying the facts and data presented. After full consideration of the evidence and the law applicable thereto, the commission adopts the investment as determined from examination of the company's records as the basis for establishing a fair and reasonable rate base.

Investment, $166,363,549 at June 30, 1954

> **"The commission staff has determined from the examination of the books and records of Oklahoma Gas & Electric Co that the company's investment in physical property at June 30, 1954, after adjustment, would be $166,363,549. That the net investment the company had made in plant above historical cost that may be considered in the rate base is $3,685,112 and that the credit balance in the Reserve for Depreciation to be $21,954,334."**

As to cash working capital, commission reduced amount of $2,150,000 to $800,000 on grounds that company had available funds arising from income tax accruals, advances on construction, customer deposits, and prepayments.

As to the findings with respect to the rate base, the commission, after making the foregoing adjustments, gave consideration to net original investment—first, with plant acquisition adjustments amounting to $3,685,112 included, and second, with this item omitted. The total rate base in the first instance amounted to $151,282,000 and to $147,600,000 in the second instance.

The commission reduced petitioner's claim of 3% for depreciation to 2.8% on the ground that "the staff has found from its studies of rates being applied in the electric utility industry would average approximately 2.8% . . ."

In testing the reasonableness of the company's proposed rate increase, the commission allowed a 6% rate of return on the net original cost rate base—first with plant acquisition adjustments in, and second, with plant acquisition adjustments out. In the first instance, the petitioner's proposed rate increase was $404,431 short of the 6% return which the commission used as a "bench mark" while the second was $183,525 below that same level of return.

modernizing?

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WHEN you're planning to install new process equipment, plan to take advantage of the full potential of modern methods of measurement and control. It's the sure way to get top value for your modernization investment . . . for the improvements in production economy, quality and versatility possible with today's new process equipment depend increasingly on control instrumentation.

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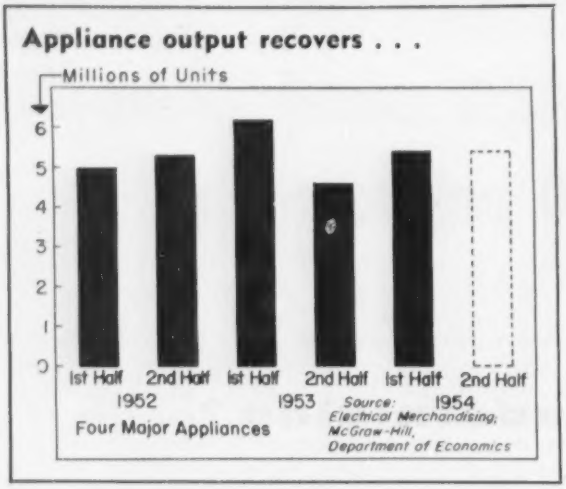
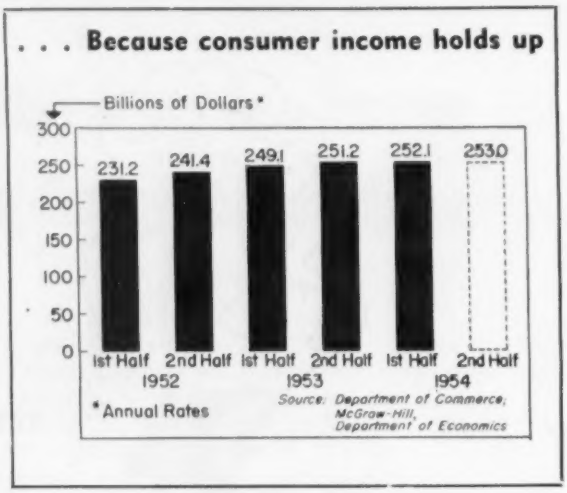




Residential Sales Outlook Is Bright

The outlook for steady growth in residential power sales this year is improving as the summer moves on. Prospects that were already good have become excellent with the latest news about home construction and appliance sales.

Housing struck a note of surprising strength with publication of the June figures for new housing starts. Builders began work on about 120,000 new nonfarm housing units in June—highest total for any month in a long time.

Whether the June figure for housing starts is the signal for another big housing boom remains to be seen. The new housing act passed by Congress will certainly help such a boom along.

More Houses Being Built . . . On the other hand, far more houses are apparently being built "speculatively"—without a buyer yet in sight—than has been customary in recent years. So it will be a few months before the experts will know if the expected buyers are going to materialize.

Boom or no boom, however, it's clear that this is going to be a good year for housing. Home completions will go over the million mark again, and will help hold the rising curve of residential power sales in the right direction.

All the evidence indicates that consumers have been buying electric appliances at a good rate, too. Appliance production dropped sharply in the second half of 1953 (chart). But it wasn't because consumers stopped buying; manufacturers had made too many appliances. Now their inventories have been worked down somewhat, and production is picking up again.

The high rate of consumer purchases of appliances is surprising, in view of the business recession of the past year. But the second chart above shows why consumers were able to go on buying heavily, even while unemployment tripled. The reason is that higher unemployment—contrary to some expectations—did not have much effect on consumer incomes after taxes.

Consumer Income Hits Record . . . Consumer income after taxes rose to a new record in the first half of 1954, in spite of the business recession. Tax cuts and unemployment insurance more than offset the income lost by people who were laid off or went on short time during the period.

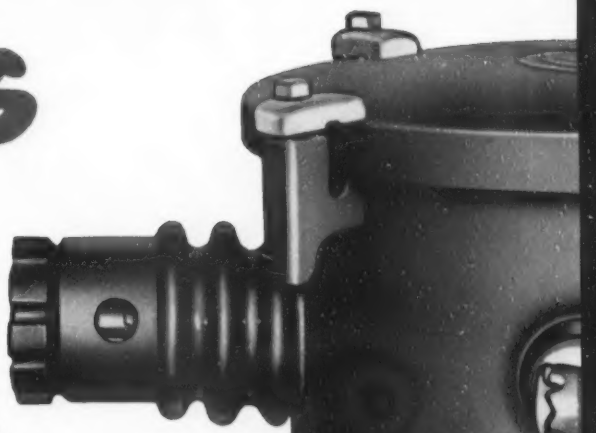
A key fact during the recession was that millions of people actually gained income, although many lost some income. Most of the income was lost by farmers or by people in the industries that cut production sharply—like steel and some makers of consumer durable goods. But many other workers actually got wage increases.

In general, people in the higher income brackets did better than wage earners in the recession. And these people are the best buyers of durable goods, including appliances. So the recession in some incomes had very little effect on appliance sales, except in high unemployment areas.

Prospects for the second half of the year are for some improvement. Chances are that the wage earner groups won't suffer much, if any, more loss of income. And the groups that have been doing well earlier in the year will continue to make gains. So it's reasonable to expect appliance sales to improve.

In addition, there's the evidence of the most recent survey of the Survey Research Center at the University of Michigan. The Center has had great success in revealing the future course of consumer buying. And its latest survey indicates that consumers now feel better about buying than they did last fall. Furthermore, the most optimistic among the consumers are the same people—in the $5,000-and-up income group—who have been buying steadily.

TOPS IN BOTTOMS



Distribution transformers are subject to weather and handling hazards both on the line and in storage. Constant exposure to abuse from man and weather makes protection difficult. Transformers are particularly vulnerable at the base, where moisture from condensation or rain will cause rust that attacks any unprotected point.

Moloney HiperCore Transformers are *tops in bottoms.* Their rugged shells are designed to stay in use despite weather and abuse. Moloney HiperCore Transformer Tanks are protected against rust forming at the base weld . . . and feature a rolled lip which prevents deterioration from weather or water. The tank base is first pressed into the shell and is bonded into a unit by a continuous seam weld. The inside edge, the only point where water might stand, is coated with a sealing mastic and rolled in, forming a lasting barrier against moisture, air, and the ravages of rust.

So, give your distribution system the advanced engineering, design, and fabrication that is synonymous with Moloney Products *all along the line.*

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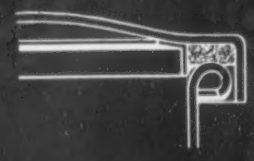
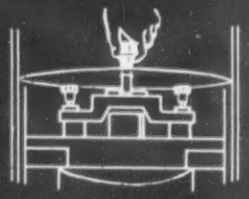
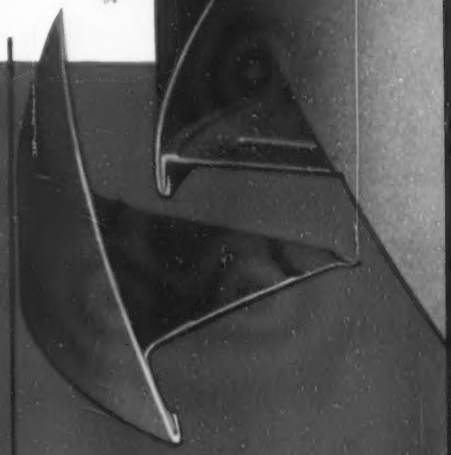


Corprene gasket retained by ring welded to tank cover. Gasket is retained in position forming a perfect tank seal. Gasket is not cemented and can be used again and again.

Moloney sidewall mounted high voltage bushings are provided with a molded, high impact resistant phenolic-cold rubber protective cap for working "hot".



Tap changer operating handle located above hot oil level. Double-moving contacts snap into position with a wiping action that assures positive contact.



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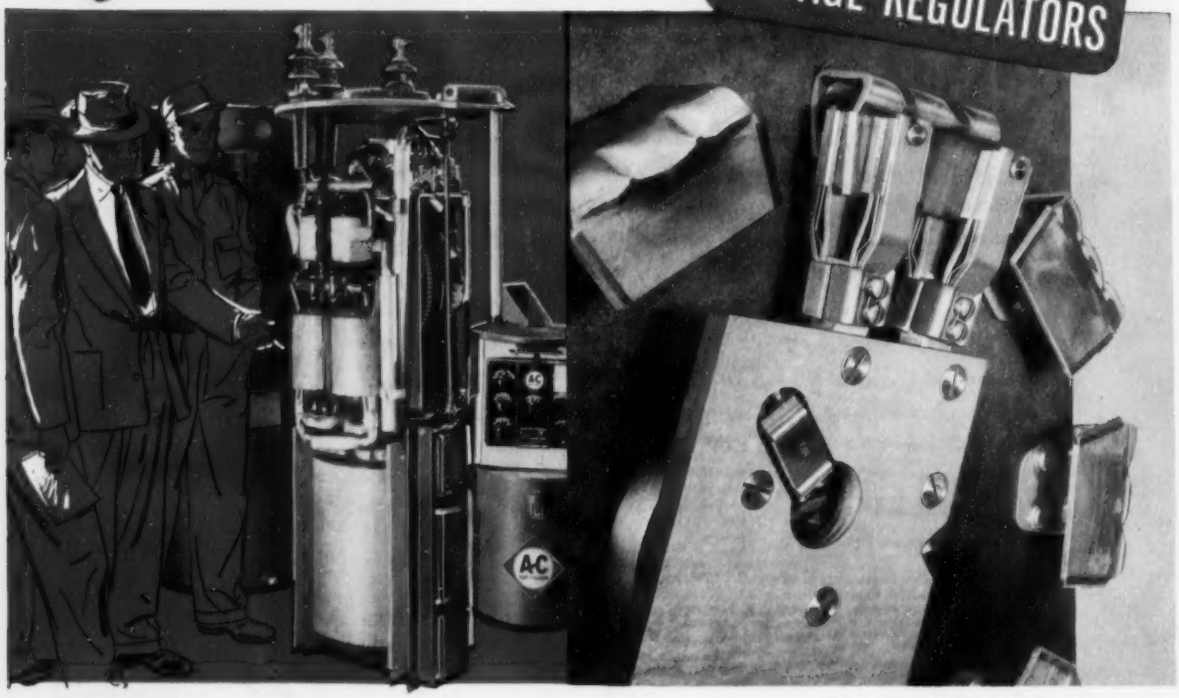

Close examination shows all the facts. For example, a close-up view of the dial switch shows wired boltheads—another reason A-C regulators give you long life with little maintenance.

Any recognized distribution system can get an Allis-Chalmers Type JFR distribution regulator for thirty days of thorough examination completely free of charge. Allis-Chalmers helps you decide for yourself because experience has shown that complete tests on your home grounds will prove to your engineers, purchasing people, operating and maintenance men that your system will get the most for its regulation dollar from an Allis-Chalmers distribution regulator.

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You'll see how easy it is to untank an Allis-Chalmers distribution regulator — why field service is simplified and speeded by its field-tested design. You'll see the "tool engineer's quality" designed into the mechanism — why you can count on years of satisfactory service with little or no maintenance. You'll see the large contacts made of arc-resisting material that have operated for over a decade on utility systems with no appreciable signs of wear.

GET THE INSIDE STORY...

Your nearby A-C office will help you get a regulator and the recently published "regulator check list," or you can write Allis-Chalmers, Milwaukee 1, Wisconsin. Get a regulator on your own home grounds and get the real inside story of how good a regulator can be.

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